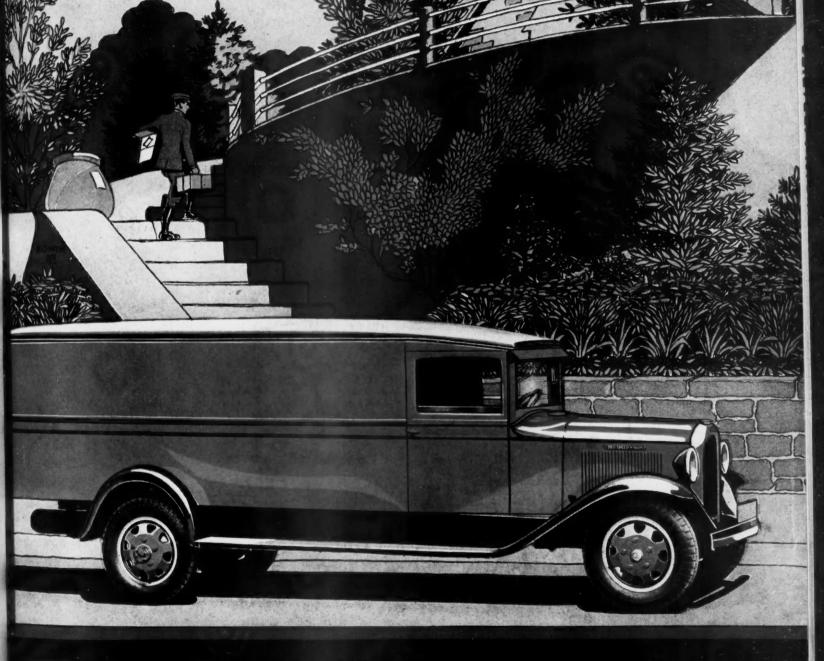
COMMERCIAL CARJOURNAL

ANSPORTATION LIBRARY LY 1932



REO

) Trucks and Speedwagons range from 11/2 to 4 s. Prices \$625 to \$2800, chassis, F.O.B. Lansing. tched bodies to suit every purpose. New Tractrailer units—11/2 to 4-ton tractors with matched i-trailers; gross capacities, 16,000-35,000 lbs.; 75 upward, chassis, F.O.B. Lansing.

BY REO

Reo bodies as well as the famous chassis are built to the Reo standard of Quality. Special designs and standard models are available to truck operators through Reo's body designing department.

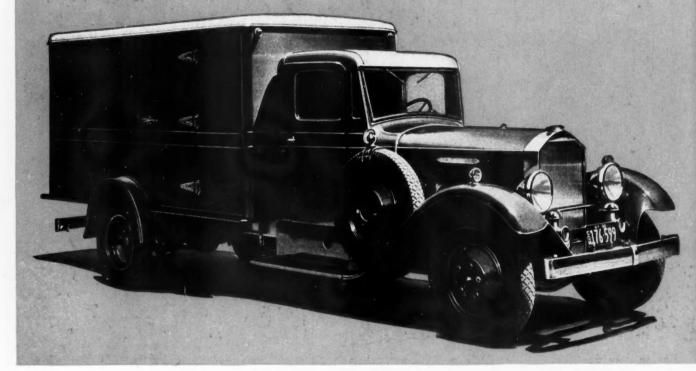
Reo bodies represent value far above the price—they are precision built, designed and matched to fit the Reo chassis—built

of carefully selected hardwood treated to correct moisture content—strongly ironed and rigidly braced—light in weight in comparison with strength.

These sturdy Reo bodies are just as reliable as the Reo chassis—they are good looking and provide outstanding comfort for the driver. Buy a Reo chassis and a Reo built body—a reliable manufacturer is responsible for both—you will have a balanced truck that will be the last word in long life; performance and appearance.

REO MOTOR CAR COMPANY, LANSING, TORONTO

Pierce-Arrow Trucks



The new 13,000 pound M. G. W. Pierce-Arrow eight-cylinder chassis—the fastest and most powerful unit in the industry of equivalent gross weight capacity—is built to yield maximum economies from high-speed highway operation. Its external appearance reflects the new day demand for distinctiveness in rolling stock.

Higher Quality

PIERCE-ARROW meets the variable transportation factors of loads, roads, terrains and climates by engineering and building each truck chassis to fit requirements of your particular haulage job.

By its adoption of a new system of interchangeability of design and manufacture, Pierce-Arrow offers 24 chassis of various sizes for all types of work. These chassis range from 12,000 to 44,000 pounds maximum gross weight, with heavy duty six and eight cylinder engines from 70 to 150 horsepower. Tractors are available from 24,000 to 75,000 pounds maximum gross train weight.

Lower Prices

Prices have been drastically reduced (from \$650 to \$1600 per truck) by Pierce-Arrow's departure from the usual practice of inflating list prices to permit over allowances on tradeins and long dealer discounts. Pierce-Arrow believes the truck buyer has become a shrewd judge of values, primarily interested in what he gets for his money. In these new Pierce-Arrows he will find traditional Pierce-Arrow quality at considerable savings. They are the finest trucks ever built—even by Pierce-Arrow.



COMMERCIAL CAR IOURNAL

with which is combined Operation & Maintenance Entered as second-class matter at the Post Office at Philadelphia, Pa., under Act of March 3, 1879

Vol. XLIII

Philadelphia, July, 1932

No. 5.

EDITORIAL DEPARTMENT

NORMAN G. SHIDLE, Directing Editor GEORGE T. HOOK, Editor

MARTIN J. KOITZSCH Managing Editor
B. CROFOOT
New York News

JAMES W. COTTRELL Technical Editor ATHEL F. DENHAM Field Editor

GEOFFREY GRIER Art Editor

TABLE OF CONTENTS

FEATURE ARTICLES

The President's Page	13
S.A.E. Heaves Three Weights Into Rating	14
How the Truck, Parts and Tire Taxes Will Be Paid	17
Trailers Ride Under Legislative Menace	18
Truck Wheels Factory Right to Food Sources	20
Uncle Sam Evaluates Truck Bids on Points	21
Engineers Flash Caution Signal on New Balloons	22
S.A.E. Groups Consider Problems of Industry	23
When Should a Piece of Equipment Be Retired?	25
Inflated List Prices Should Be Exploded	26
Confidence Game Tricks Shippers and Haulers	27
State Motor Vehicle Size and Weight Restrictions	30
Three Aces from Three Shops	32
Motor Freight Tariffs Are Basis of Stability	34
Rails and Express Trucks Join In Pick-Up Delivery	35

NEW PRODUCT DESCRIPTIONS

Mack Puts Three Sizes in Medium Range	3
Lycoming Gets Rigidity in New S Engines	3
New G.M.C. 2-3 Ton Lists at \$745	3
White 691 Tractor Meets 40-ft. Restriction	3
Federal 8-Ton 6-Wheeler	3

DEPARTMENTS

After Hours	28
Our Own Ear to the Ground Department	29
The Overload	29
News, Automotive Flashes	42
Personnel Changes	42
Legislative News	43
Commercial Car Specifications	48
Advertisers' Index	78

Published Monthly by

CHILTON CLASS JOURNAL COMPANY

Chestnut and 56th Streets, Philadelphia, U. S. A.

C. A. MUSSELMAN, President and General Manager
J. S. HILDRETH, Vice-Pres. and Director of Sales
LPH, Vice-Pres.
HIN A. CLEMENTS
Assistant Treasurer
W. BROWNELL
Business Manager
magnetal Car Journal
GEORGE D. ROBERTS
Advertising Manager W. I. RALPH, Vice-Pres.

JOHN A. CLEMENTS
Assistant Treasurer A. W. BROWNELL Business Manager Commercial Car Journal

Telephone......Sherwood 1424, Philadelphia OFFICES

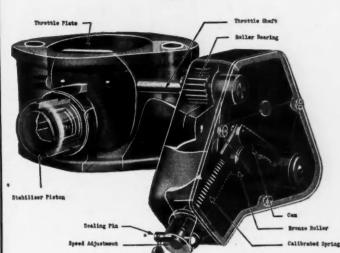
New York—239 W. 39th St., Phone Pennsylvania 6-0080 Chicago—367 West Adams St., Phone Randolph 9448 Detroit—710 Stephenson Bldz., Phone Madison 2090 Cleveland—1140 Guardian Bldz., Phone Main 6860 San Francisco—1045 Sansome St., Phone Douglas 4306 Los Angeles—Room 651, 1206 Maple St., Phone Westmore 6477 Portland, Ore.—72 Fifth St.

Controlled by United Business Publishers, Inc., 239 W. 39th St., New York; ANDREW C. PEARSON, Chairman Board of Directors; FRITZ J. FRANK, President; C. A. MUSSELMAN, Vice-President; F. C. STEVENS, Treasurer.

SUBSCRIPTION RATES: United States and United States Possessions—\$2.00 per year. Pan-American Union and Canada—\$3.00 per year. Foreign—\$4.00 per year. Single copies 40 cents.

Make Checks, Money Orders, etc., payable to Chilton Class Journal Company MEMBER OF THE AUDIT BUREAU OF CIECULATIONS





Governors Are Like Carburetors

Governors, like carburetors, must be precisely and painstakingly adapted to the characteristics of the different motors they are to serve. Efficient operation is otherwise impossible.

Handy therefore offers a complete line of individual Governors, each model calibrated at no less than five points to meet the exact requirements of some particular motor.

The answer, in Governors as in carburetors, is performance. And Handy Governor performance leads the world.

Speed control not approximate but faithfully accurate! And full, unhampered acceleration and power clear up to the point where the Handy

Every haulage unit needs a governor. See to it that yours is a good one—a Handy, the standard of the industry.

> The Handy Governor Corporation, world's largest builder of governors for gasoline engines, is building a greater proportion of the world's governors today than ever before.

HANDY GOVERNOR CORPORATION 3929 W. FORT ST. Detroit

DYGOVERNOR

GET WHAT YOU ASK FOR... wheels that really are DEMOUNTABLE!

"Do WE want demountable steel wheels? We'll say we do!" That's the verdict of the overwhelming majority. Today nine out of every ten motor vehicles are being turned out with demountable steel wheels.

But not every operator is getting what he asks for — wheels that really are *demountable*. After struggling with frozen wheels, many an operator has decided that his "demountables" were christened by the same humorist who nicknamed brickbats "Irish confetti."

It's a different story, though, with Budd-Michelin Wheels. They

are demountable in fact—as well as theory. Budd Duals give you complete clearance around each stud. In fact, the wheel doesn't touch the studs at all. That's why Budd-Michelin Duals go on quickly—why, if you want to take them off, they slip off easily. No barked knuckles—no exploded tempers—no lost time.

More than that, Budd Duals save you money on tires. How? By insuring perfect tire alignment—permanent tire alignment. Budd Duals eliminate the expensive rubber-scuffing that makes some operators' tire bills look like the national debt. Even if a greenhand

changes them, Budds fit their accurately machined hub faces perfectly. They line up perfectly on their permanent hub studs. They have to. For the Budd-Michelin double cap-nuts lock each dual wheel on separately. One set of cap-nuts for the inner wheel—another for the outer wheel. Result—no wobble—no shimmy—perfect tire alignment—better tire mileage than you ever got before.

No wonder Budd makes more sets of truck and bus wheels than all other wheel companies put together! Budd-Michelin Duals, Budd Wheel Company, Detroit and Philadelphia.



THE PRESIDENT'S PAGE

Salesmen Are Not Entirely to Blame for Making Overstatements in Regard to Capacity Rating. Capacity Has Become a Myth. Makers Don't Agree. There is No Standard. Trucks Should be Rated on Ability pointed out the practices traceable to alleged inflated prices. Nearly all have berated the "capacity rating" situation.

We now have something very definite to say about "rating." We think our suggestions to be very constructive and hope that they provide a standard by which all capacities may be rated.

In the absence of any standard little is the wonder that so many liberties have been taken with capacities. Capacity today is even more mean-

COMMERCIAL CAR JOURNAL

PHILADELPHIA

PENNA.

JULY, 1932

VOL. XLIII, No. 5

VERY business has its problems, no industry is without them. Consequently each retail group feels that they are in about the "worst business in the world" under present conditions. There are no sinecures. If problems ever cease to arise business will cease to be business and will not attract the interest of brainy and resourceful men. Actually, business is never as good as we hope for, nor as bad as we think.

1932 found the truck industry facing a number of problems emphasized by the prolonged business recession. Some of these we brought upon ourselves, while others were imposed upon us.

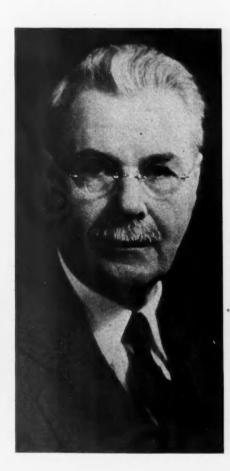
On the one hand we are handicapped by extremely burdensome taxation and legislation; on the other, by certain trade practices which we have allowed to creep into the industry. In spite of these problems I believe the automotive industry is one of the best, if not the very best, to be identified with today and tomorrow, as well as yesterday.

It is my opinion that if we will take some action on the problems over which we, individually and collectively, have complete control, that the problems which are imposed upon us by others will have a less serious aspect.

Those who have preceded me on The President's Page have covered in a splendid manner many of the tribulations of the industry. One executive dealt interestingly with taxation and legislation; one explained in detail the evil of over-allowance for used vehicles accepted in trade; another

P. H. Seott

PRESIDENT AND GENERAL MANAGER Reo Motor Car Company



ingless than the old N.A.C.C. or the succeeding S.A.E. horsepower ratings. The term is so badly abused that the public has almost entirely lost confidence in it, with the result that little can be claimed for it.

We cannot complain much if retail salesmen make over-statements, for there is no agreement among the makers, nor any standard to go by. Since capacity has become a myth, we no longer have much ground left to stand upon if users double up the loads on us.

But we can do this. . . . Rate our trucks for ability, and that is exactly what we are about to announce to our dealers and the public (prior to the time the July issue of COMMERCIAL CAR JOURNAL goes to press).

CAR JOURNAL goes to press).

For the purpose of listing our models in specification tables we will rate them for capacity alone (much in the same manner that we all adhere to the S.A.E. horsepower rating). From this time on, however, we will rate Speed Wagons in our advertising, literature, manuals, and on the Caution Plate, according to ability: i.e., what the vehicle will definitely do. Isn't that what users want to know after all? For example, one of our recently announced models will carry this rating:

"8500—4½—51"
8500 means the weight of chassis plus body allowance, plus amount of payload beyond which the abuse stage approaches; in other words, the maximum load consistent with economical long life performance.

4½ means the grade it will climb Turn to page 32, please

S.A.E. HEAVES THREE WEIGHTS INTO RATING

TARTING with the advantage of a newly-suggested factor for rating trucks, the S.A.E. committee which has been laboring with the problem found two handicaps in the way of a final decision. Less than a majority were present at the meeting at White Sulphur Springs, W. Va., during sum-mer sessions of the society and their vote approving a three-part weight rating and recommending use of the formula passed upon at Detroit for computing performance ability, therefore, is not final but will be forwarded to all members of the committee for action. A mail ballot may settle the matter but the chances are that the committee will assemble again, this time during the National Transportation Meeting of the S.A.E., scheduled for early October in Toronto.

Therefore the room to be shown future generations as the historic spot where truck rating was adopted and signed may not be in the United States at all but in one of the provinces of Canada where scenery and hospitality abound but the laws are different.

Faithful followers of L. R. Buckendale, chairman of the committee, hanging up their "dress-for-dinner" coats and missing a general session of the summer meeting, voted, almost unanimously, in favor of three weight figures for the weight part of a truck rating. When read aloud the rating sounds like signals for a wide run around right end, so—66-105-31.

Translated into truck language by

Translated into truck language by adding 00 for hundreds which are omitted, this means that the truck chassis carrying capacity is 6600 lb., its gross weight is 10,500 lb. and that the chassis, without engine, clutch, transmission or transmissions, weighs 3100 lb. The first figure can be obtained from the COMMERCIAL CAR JOURNAL Specifications Table by subtracting stripped chassis weight from vehicle gross weight. The third figure is the new factor, of which more, and much, must be related.

To T. C. Smith, American Tel. & Tel. Co., goes credit for suggesting that weight of the load-carrying elements of a chassis, as distinguished from the power elements, be a factor in rating. He proposed that vehicle gross weight be calculated as 3.5 times

Windup of Committee Work Deferred When Fleet Man Proposes Interesting Method Which Would Make Gross Weight Computation a Simple Mathematical Process

this weight and that gross capacity (that is, body, load and cab) be derived from vehicle gross weight, as calculated, by subtracting actual chassis weight from this calculated gross weight.

No visionary was Mr. Smith; he got right down to brass tacks or cases or business or whatever it is that those proceeding directly to the business at hand get down to. He opened up with the concrete proposal that "the gross vehicle weight be calculated and not supplied arbitrarily by the various truck manufacturers, all of whom probably approach the matter from different viewpoints. Calculating the G.V.W. is the preferable method because it gives ratings which can be compared upon the same basis."

He followed up by suggesting the formula G.V.W. = (S.C.-P) 3.5. In which S.C. stands for stripped chassis

Examples of Manufacturers' Gross Vehicle Weights Compared With Proposed G.V.W. and With Gross Capacity

Truck Model	Chassis Strippe	Engine, Clutch, Transmission	Calculated Gross Weight	Maker's Rated G.V.W.	Gress Capacity .
Autocar A Autocar R Chev. LT Diam. T 216B Dedge F30. Dedge G43A. Ford BB Ford BB Ford BB Ford BB HIC A3 Mack BL Reo IA White 611 INC A4 GMT T45 INC A6 GMT T45 INC A6 GMT T45 INC A6 GMT T61 INC A6 GMT T61	2,855 3,300 2,756 3,345 2,847 3,040 3,430 3,711 4,200 5,359 5,035 6,200 6,790 12,500	1,490 1,380 630 725 683 754 482 482 894 1,090 655 1,080 1,275 1,183 2,600 2,037	14, 140 13, 960 7, 790 9, 010 7, 250 8, 250 9, 580 9, 580 10, 890 13, 020 14, 290 17, 240 19, 620 34, 650 31, 350	12,000 11,400 8,200 8,000 8,270 10,000 8,400 10,000 9,800 10,500 8,600 13,360 16,000 18,700 22,000 36,500 30,000	8,610 8,590 4,930 5,710 4,500 5,430 5,910 6,150 6,150 8,220 8,940 11,040 12,830 22,150 20,360

Gross weights in column C are calculated from weight of chassis minus engine, clutch and transmission. The formula is: Gross weight equals 3.5 x (chassis weight column A minus weight of engine, clutch and transmission as given in column B). Gross capacity in column E equals calculated gross weight (column A).

weight as published and P equals weight of powerplant. He strengthened its position by pointing out that "If you study items thus calculated as compared with manufacturers' arbitrary ratings I believe that you will agree that this method provides a much more logical and usable scheme. It is based upon the amount of material in the weight-carrying part of the chassis, excluding the powerplant."

Foreseeing that many questions would arise concerning actual application of the formula, Mr. Smith submitted a table of figures for "some of the representative trucks now commercially available in four general weight classes."

The accompanying table, differing from Mr. Smith's only in omission of wheelbase, maximum tire size and piston displacement, shows that the factor of 3.5 proposed agrees remarkably well with present practice.

To say that the new factor merely impressed the committee would be to do it an injustice. It made a hit. It provides a way of calculating vehicle gross weight from known, or easily determinable facts. Nothing is left to factory viewpoint, judgment or policy. A grammar school pupil can calculate the vehicle gross weight as well as the keenest fleet manager. A rising vote of thanks—allsayaye.

The Smith three and one-half times (3.5) factor brought the committee right back to the starting point on fundamentals of truck rating and to the all-important question whether or not factories should have any say in ratings. Mathematicians can supply formulas to solve given problems and they can prove correctness of the answers obtained, whether or not the answers are pleasing to those asking for them. But mathematicians cannot determine the terms of the problem.

Ever since the committee was appointed, in fact before its appointment, this question of what factories



should have to say about rating trucks has been foremost. More than a year ago, in May, 1931, to be exact, one truck factory executive raised the issue in these words: "To my mind, and I have preached this for years, there is need for a bureau where a manufacturer can take his chassis and have a disinterested, capable third party establish a payload rating and body allowance similar to the manner in which the Underwriters' Bureau establishes ratings on fire apparatus water pumps."

The now-famous Buckendale formula, G.V.A. $= \frac{T \times R \times E}{W \times (G + F)}$, used

known facts — piston displacement, gear reduction and tire radius in connection with assumed, and agreed upon, factors for grade, rolling resistance and general overall mechanical efficiency—to calculate vehicle gross weight. It could be adapted to varying conditions but once the facts were settled it gave an answer free of whim, hope or doubt, in pounds of vehicle gross weight.

Obviously, the Buckendale gross vehicle weight does not completely cover all of a truck's characteristics. Putting a very slow rear axle ratio in a truck gives it a large gross vehicle weight rating, under the formula, without showing whether or not the chassis is able to support the load imposed upon it. Putting on larger size tires instead of adding capacity reduces the formula gross weight because larger tires have the same effect as installing slightly higher (faster) rear axle gearing. The formula, moreover, does not tell how fast a The formula, truck can surmount the imaginary hill and thus omits a factor in which owners are taking a keen and deep interest.

Mathematicians raise no loud cries of protest if a formula is switched about; so long as the factors remain the same they can choose any one for the answer. During the Atlantic City meeting of the committee the Buckendale formula was switched about, inverted and converted to the limit. Applying it to determine grade ability pleased many. But when so applied the formula could not be used to establish vehicle gross weight. That figure must be determined in some other way. During this meeting it was suggested that trucks be rated on gross weight, grade ability and speed. Those who have followed the subject will recall that the rating was to be expressed in three figures as "20-4-35," meaning 2000 lb. gross, able to climb a 4 per cent grade in high and capable of 35 m.p.h. maximum.

Committee members, after deliberation in the meantime, assembled in Washington in October during the

ill

a

e.

of

ns

li-

b-

of

m-

al

ng

nd

he

ely

to

It.

cle

ily

eft

or

can

as

A

nes

tee

on

to

or

ply

and

an-

the

sing

can-

rob-

apint-

ries

urnal

Transportation Meeting. Here a three-part rating, advocated by A. G. Herreshoff, Dodge Brothers, won approval in a surprisingly short time. The rating comprising vehicle gross weight, grade ability and speed gave to factories the power, and the duty, to specify gross weight with the restriction that they must put enough rubber on the wheels to carry the weight. Grade ability was to be calculated by formula and maximum speed from governor setting or manufacturer's recommended maximum engine speed and rear axle ratio and tire size.

There was no beating about the bush on the question of factory action on vehicle gross weight. Mr. Herreshoff advised that "Any truck rating system shall be so worked out that any factor going in the rating is not left to the word of the manufacturer but is subject to physical measurement on any truck so that this rating can be applied fairly by any interested party to trucks of various manufacture or to trucks manufactured prior to adoption of this new rating method, so that there could be no discussion of the manufacturer's estimate of power or strength."

Tire capacity is the logical check on vehicle gross weight ratings, according to Mr. Herreshoff's opinion expressed at the meeting. He said, "The manufacturer in specifying the largest tire size has committed himself in the eyes of the operator to the maximum gross weight the vehicle can haul. The tires, then, determine the gross weight."

Steam Rollers

Linking gross weight to tire capacity still leaves manufacturers plenty of leeway in general design, and Mr. Herreshoff did not sidestep the question. "If a frame can conveniently carry a few hundred or a few thousand more pounds, we must conclude that we have a vehicle of superior quality, but not of superior capacity. As long as engineers are capable of exercising independent judgment, there will be differences in their product. Trucks approximating steam rollers will be one extreme and structures barely sufficient to support a few hundred pounds payload in addition to the body will be the other. This is not a matter of rating but rather a question of policy for the manufacturer."

Establishing gross weight on tire capacity basis gives a manufacturer a chance to "exercise independent judgment" to the extent of over-tiring a truck for the purpose of obtaining a high rating. That action, obviously, constitutes overloading which brings its own penalties. The Herreshoff plan includes another curb on such over-rating because an overloaded vehicle will make a poor showing in the grade ability formula, lacking power to move the weight specified.

The January meeting of the committee brought about agreement on

the factors and assumptions in the grade ability formula. Torque was assumed to be .625 times piston displacement in cubic inches, rolling radius of tires to be Tire & Rim Association figures at "rated capacity," rolling resistance at 1.5 lb. per 100 lb. (15 lb. per 1000 lb.). M. C. Horine, Mack, suggested a different way of expressing the performance rating but committee members were in accord, in general, about the formula factors.

With this background in mind it is easy to appreciate the value of Mr. Smith's proposal to calculate vehicle gross weight by multiplying chassis weight less powerplant by 3.5 and to understand the favorable impression it made on the committee. It is not perfect; one member of the committee explained that adding only 75 lb. to a frame makes it approximately 75 per cent stronger, but quite evidently it expresses common practice of today in general terms.

Legislation Again

Legislation, accountable neither to engineering nor to sales, halted approval of the Smith proposal. The thought of legislators pouncing upon the figure 3.5 and incorporating it into law, there to remain, shocked the committee members. They know that progress continues, that the fight against useless weight never ceases, that new alloys and new designs may bring new conceptions of chassis weights. Allow present engineering thought to be "frozen" into legislation -not while there is breath left to protest. One committee member showed that adoption of such a factor even ten years ago would have rendered development of the modern motor truck impossible. Another pointed with alarm to laws of Pennsylvania which set arbitrary limits on the weights which a chassis of given weight may carry. Committee members declined to be boomerang throwers, avalanche starters or fight promoters.

"Trailer" Weight

They clung, however, to the idea that truck buyers could use weight of chassis without engine, clutch and transmission to advantage. Fleet managers could compare these "trailer" weights directly or they could determine the multiplying factor used by dividing the new weight factor into vehicle gross weight, established by manufacturers. A factor of 4 would indicate that the manufacturer was liberal in computing gross weight, a fact which he might explain by use of strong, as well as light alloys, a high percentage of stampings and forgings, and so on. A factor of 2.5 would indicate ultra-conservatism.

By omitting any factor from the proposed rating the committee would bar legislators from basing laws and regulations on S.A.E. recommended practice. Legislators cannot justify legislation based upon it as representing automotive engineering conclusions. The new factor is simply a weight, just as the weight of cab, or rear axle or radiator might be listed in specifications for comparative purposes.

With but one dissenting vote the Smith chassis less powerplant weight was approved as one of three weight figures. It was placed third in the sequence of numbers by which the committee proposes to rate trucks. The first, advocated by Mr. Smith and strongly, and persistently, championed by Mr. Horine, is chassis gross capacity. It is the difference between vehicle gross weight and chassis weight (in this case stripped chassis weight as now published, not the Smith figure). The second figure is vehicle gross weight set by the factory but not exceeding carrying capacity of tires specified.

Having finished concentrating on weight the committee turned to the grade and speed factors approved at Washington and Detroit. Several members favored giving grade ability, as figured from the formula which had received its final polishing at Detroit in January, and maximum speed separately. Horine again spoke in favor of his single figure performance factor combining speed and hill-climbing ability in one assortment of numbers, as 175.

The committee voted to approve the formula and all sundry and various of its accompanying and inclusive assumptions and bases. With this formula the ability of any truck can be calculated readily in single or double answers as desired.

Rating Checks

Truck rating as it now stands allows a truck manufacturer to put his own vehicle gross weight rating on a chassis, subject however to certain checks, to wit; first, that "this weight must not exceed the capacity of the tires on the vehicle, taking the capacities as agreed on by the Tire & Rim Association"; second, gross capacity of the chassis, that is, its carrying capacity, will be compared with its own weight and the vehicle gross weight by alert buyers; third, the new Smith weight figure of load carrying elements of the chassis will certainly be used for comparative purposes; fourth, the grade ability formula will reveal shortcomings in power and performance of trucks and form a basis for comparison of the power elements of the chassis, this supplementing load - carrying comparisons of the Smith weight figure.

Result of the White Sulphur Springs meeting therefore is to throw two additional checks upon vehicle gross weight into the proposed truck rating. The manufacturer has the first bid but he will be restrained by the proposed "official system."

HOW THE TRUCK, PARTS AND TIRE TAXES WILL BE PAID

Trade is Urged to Make Public Tax Conscious So That It Will More Readily Support Tax Battles

UTOMOTIVE leaders are unanimously of the opinion that in order to make it easier for the industry to obtain public support against further increases in federal, state or local motor taxes, the automotive trade should keep the public conscious of the excise taxes on trucks, truck bodies, motor cars, parts, tires, accessories, lubricating oils and gasoline, which went into effect at 12.01 a.m. standard time, June 21, 1932.

Theoretically the excise taxes are imposed on manufacturers; practically it is the public that pays them, because while the manufacturer makes the tax payments to the federal government he collects the amounts of the taxes from his customers—the retail trade—and the retail trade in turn collects from its customers—the public.

This article, therefore, is intended to familiarize the trade with the automotive excise tax provisions of the so-called Revenue Act of 1932 and with the paper work involved in order that dealers, salesmen, sales executives, service men and office personnel may talk the tax subject intelligently when they quote delivered prices or when a customer begins questioning the retail invoices.

vn

a

ht

ac-

of

wn

ht

ith

le-

nly

vill

er-

sis

nts

ing

the

ngs

ldi-

oss

ng.

bid

ro-

rnal

For purposes of clear presentation, this article divides the tax subject into two parts: (1) The paper work, with its recommended methods of listing federal taxes, and (2) the official regulations of the Bureau of Internal Revenue covering the scope and rates of the excise taxes. The first part is presented on page 47; the second follows, and is for the most part a paraphrasing of the official regulations.

Truck Chassis and Truck Bodies

A tax rate of two per cent on the manufacturer's selling price applies on truck chassis and truck bodies primarily designed or adapted for the transportation of property along highways and roads.

If a body manufacturer purchases a tax-paid chassis and attaches thereto a body of his own manufacture, he is liable for tax on the sale price of the body only. The sale price of the body must be accurately determined and specifically recorded and billed separately. Otherwise the body manufacturer will be required to pay tax on the price of both chassis and body.

The same rule applies where the manufacturer of a chassis installs thereon a tax-paid body and sells the completed vehicle. However, the chassis manufacturer may, with official approval, purchase bodies tax-free. But when the bodies are resold he is required to pay tax on his sale of the completed vehicle as the manufacturer of both chassis and body. (There is no provision granting such a privilege to body manufacturers who purchase chassis.)

One article in the chassis and body section applies particularly to those manufacturers who mount commercial bodies on passenger-car chassis. In such cases the sale of the body and the chassis must be billed separately and a tax of 2 per cent paid on the commercial body and 3 per cent on the passenger-car chassis. This combination of tax rates applies also if an automobile body is mounted on a truck chassis.

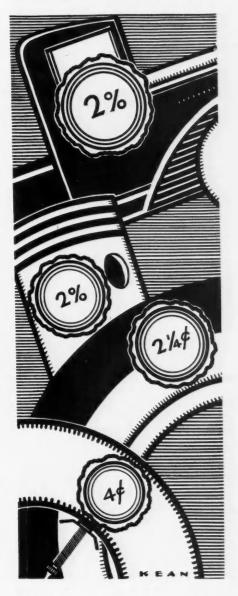
Any parts or accessories for truck chassis and truck bodies sold on or in connection therewith or with the sale thereof are taxable at the rate applicable to the sale price of the complete article, that is, two per cent.

Parts and Accessories

The regulations stipulate that the term "parts or accessories" includes (a) any article the primary use of which is to improve, repair, replace, or serve as a component part of such vehicle or article, (b) any article designed to be attached to or used in connection with such vehicle or article to add to its utility or ornamentation, or (c) any article the primary use of which is in connection with such vehicle or article whether or not essential to its operation or use. The rate of tax is two per cent.

Tires and Tubes

The tax on tires, whether solid or pneumatic, is 2½ cents per pound on total weight, exclusive of metal rims or rim bases. On inner tubes the tax is 4 cents a pound on total weight, in-



cluding the air valve and stem or any other mechanism attached thereto which may be used for inflating the tube or retaining inflation.

The tire tax is paid by the tire manufacturer, who will bill it to the truck manufacturer, who, in turn, will bill it to the dealer, who, in his turn, will bill it to the ultimate consumer.

Where the truck manufacturer uses tax-paid tires on or in connection with the manufacture of a truck he is entitled to a credit amounting to the rate of tax on the finished vehicle applied to the cost of the tires and tubes. As an illustration, a truck may sell at \$500. The tax at two per cent would be \$10. The cost to the truck manufurn to page 47, please

TRAILERS RIDE UNDER

RAILERS and trucks, partners in highway transportation, as shown by the writer's paper, "Use of Trailers with Motor Trucks," presented during the Summer Meeting of the S.A.E., are, it seems, likewise partners in trouble. They face a common peril, legislation, which discussers of the paper pictured as a growing menace to all heavy-duty highway transportation.

Owners and operators of trucks and trailers must act to ward off the danger by restricting use of too long trains and preventing snaking, both of which inspire public resentment. One speaker, A. J. Scaife, White Co., president of the S.A.E., especially warned against offending the public on the highways on holidays and Sun-

F. C. Horner, G.M.T., sounded his warning in no uncertain terms, saying, "The expansion of use of heavyduty, high-speed vehicles is ended. The trend of legislation is against it, primarily because of abuses. * * * The time was never so opportune for railroads to force through legislation against motor transportation. The legislatures of 42 states meet next year and the railroads have the automobiling public with them. We are headed for a lot of trouble." That the trouble predicted is no trivial an-That noyance but of vital concern to all truck owners was testified by A. F. Coleman, Standard Oil Co. of N. Y., who said, "We may have to revamp our fleets." And by "we" he did not refer solely to his own company's fleet.

Responsibility for the situation rests to some extent upon operators, in the opinion of Leo Huf, Pure Oil Co. He pointed out that, "The driving public fears to pass a large swaying, wiggling object on the road." J. F. Winthester, Standard Oil Co. of N. J., blamed snaking on owners who neglect maintenance and he clinched the argument later in the sessions by showing motion pictures of full trailers following directly in tracks of their towing trucks.

Several prominent fleet men advocated more moderate limits on length of trailer trains. One, Mr. Winchester, warned that legislatures were against trailers because manufacturers recommed trains 85 ft. long and he advised carrying along work to reduce trailer train overall length. Mr. Coleman, who was one of many who mentioned the recent decision in the Texas case upholding the right of a



state to legislate against motor transportation to benefit rail lines, suggested that 65 ft. be the limit for truck and trailer trains, and that axle loads of at least 16,000 to 18,000 lb. be permitted on balloon tires.

F. K. Glynn, American Tel. & Tel. Co., chairman of the S.A.E. automotive transport code committee, agreed that legislation was the key to the trailer situation. He explained that the S.A.E. is interested in codes from their engineering aspects and that the committee is working up a code for submission to the Motor Vehicle Conference Committee.

Legislation may cost the seller of motor equipment money in an unforeseen manner, in the opinion of R. B. Jones, chief engineer, Trailer Co. of America. He asked dealers and branch managers to consider what would happen when a hauler, who had bought trailers on time, was forced to give up his contract when a law was changed. He got no direct answer but nods and shakings of heads about the room were eloquent.

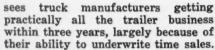
Fifth wheels, lacking standardization (the need for which was stressed in my paper) hamper the development of "ferry truck" service as well as other applications. Mr. Jones said that he believed that standardizing fifth wheels would be an advantage to both truck and trailer manufacturers and that they would welcome further efforts along this line.

A concerted effort to combat influences working against motor trans-

LEGISLATIVE MENACE



Factory Men and Operators Urge Concerted Action Against Legal Restrictions Inspired by Rails and Public Resentment Against Snaking



"Everybody cannot be on a railroad siding but trailers put every shipper on a siding." For this reason Mr. Menhall stated that growth of trailer business is assured.

Trailer and truck operations in the Oklahoma oil fields were shown at the close of the session by courtesy of J. F. Winchester, Standard Oil Co. of N. J. Truck crews moved tanks, steam boilers and other heavy parts across country on trailers and skids; for heavy loads they hitched trucks side by side, in fact, as one observer remarked, "those men moved every-thing but the scenery."

Being, at one and the same time, the speaker at a session of the Summer Meeting of the Society of Automotive Engineers and the staff items from the paper I shall try to be more reporter than author. abridged version follows:

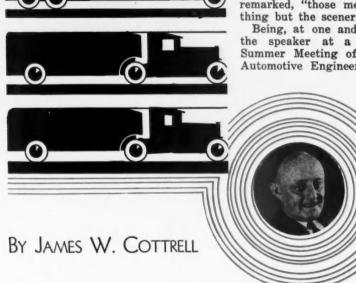
Use of trailers with trucks is growing rapidly; trailer registrations at the close of 1931 show an increase of 27 per cent above 1930 and 300 per cent compared with 1927. Figures for total truck registrations show no parallel, there was a slight loss between 1930 and 1931 and the gain between 1927 and 1931 was only 14.9 per cent. For comparison with general business -if anything is to be gained by comparing plus and minus figures—the trailer curve looks like a business index or commodity price curve upside

Legislation comes first among fac-tors which determine whether or not trailers may be used to advantage, because if trailers are prohibited that is the end of the matter, followed in turn (but not in order of importance) by grades and road conditions, characteristics of loads to be hauled, loading and unloading problems, length of haul, time available from shipping platform to receiving platform and convenience of the shipper.

Legislation and regulations helped the trailer get its start and win its place in highway transportation. It is not recorded that lawmakers were inspired particularly by kindly regard for the trailer but rather that they sought to protect their precious roads. But just as soon as they allowed greater loads on six wheels—or eight or ten-than on four, just so soon did they invite trailers to a feast of busi-

The effect continues. Fred B. Lautzenhiser, International Harvester Co., says: "More and more each year, state legislation is making trailer use imperative by the restrictions placed upon total weights on individual axles. At the same time some states are placing maximum dimensions on overall train lengths, which, in conjunction with the limited axle weights, makes interstate hauling a problem."

Roads and grades are a limiting TURN TO PAGE 32, PLEASE



portation was advocated by more than one discusser. M. C. Horine, Mack, made a strong plea for united action. "The weakness of our industry is not truth but lack of organization to put those truths over."

Trailer manufacturers are doomed to extinction despite the fact that future of the business is bright. This startling prediction came from no outsider but from J. W. Menhall, president, Highway Trailer Co. He foremember assigned to cover the session for COMMERCIAL CAR JOURNAL is an unusual but nevertheless enjoyable experience. I shall refrain from quoting from my introduction by L. V. Newton, Byllesby Engineering & Management Corp., chairman of the meeting, but take pleasure in quoting from remarks of fleet operators and factory officials who discussed the subject of my paper, "Use of Trailers With Motor Trucks." In extracting

anch

ould ight

give

was

wer bout

diza-

ssed

ment

l as

said

izing

ge to

irers

rther

rans-

ournal

TRUCKS WHEEL FACTORIES RIGHT TO FOOD SOURCES

They Follow the Harvests, Farm to Farm, Throughout the Land

HE truck has been ordered to another big job. Instead of bringing harvests to the canneries the food industry is planning to use the truck to take preserving factories to the farms.

Maintenance of great stationary factories in the hearts of the various food centers is very costly, especially where they are operated only a few months in the year. Why tie up capital in idle equipment? say the food merchants. Why not take the factories to the farms and move them after each harvest? The answer put the truck in yet another great vocation. A fleet of these portable factories is already in the field, and, like farm hands in the plains of the Mississippi, moving northward from farm to farm with the grain harvest, this fleet of trucks rolls over farm lands, preserving on its way fruits and vegetables for profitable metropolitan markets. Harvest on many farms in the near future will not be complete without a truck and its "factory" unit.

The idea of taking the quick-freezing process to the farm and following nature's harvest schedule from point to point in accord with the season was conceived by the General Foods Corp.

The idea found its solution in the truck, and judging from present indications it may entirely revolutionize the present set-up of the food industry. The portable factory for packing fresh and perishable foods developed by one of General Foods' laboratories consists of a new, self-contained froster for mounting on a five-ton truck. The entire apparatus is inclosed in a cabinet about 8 ft. high and 5 ft. wide.

These little factories on wheels can be operated right at the farm for packing vegetables; at the orchards for fruits, and at the water's edge for fish in all seasons, from Florida to New Jersey, from Newfoundland to New Orleans. The units will almost never be idle except, of course, for overhaul-

ing and repairing, and during their pilgrimage from point to point.

Ralph G. Coburn, vice-president, General Foods Corp., enumerates many advantages for this new preserving process. Great losses are incurred in shipments of perishable foods from farms to packing centers. On the other hand, fixed plants maintained right at the farm or orchard

are expensive because of the idle offseason. The portable, quick-freezing packing plant seems to be the solution in the prevention of these losses. Economic conditions in general may be improved in the food industry as well as the country as a whole through the employment of this new method. If a drought or flood lays waste the farms of Kansas and Missouri, packers who are not tied hand and foot by their great stationary factories can move out like a band of modern Pilgrims, motoring with their portable machinery mounted on trucks to other rawmaterial sources in more fortunate parts of the country. On the other hand, sections blessed with heavy crops need not let great quantities of perishables spoil for lack of preserving facilities or before they can be sold through clogged market channels. Again the packers, with their portable equipment, can move in and take advantage of the bounty, storing away their products for later and more favorable markets. Because of this flexibility, stabilization of markets for perishable food crops may be partially brought about, as may be the ironing out of the peaks and valleys of seasonal food prices to the public. Moreover, an improved and enlarged scope of trading in perishables throughout the land is anticipated. Pacific and Gulf of Mexico fruits and fresh New England fish may be available the year around in any part of the country.

The itinerary for a factory on wheels might take it from one end of the country to the other during the course of a year. Through the gates of a strawberry farm in Michigan, for example, there comes a portable froster. The unit is placed in almost any vacant spot and requires nothing more than connections for water and electricity. Within a few weeks the froster packs a few hundred acres of perishables at 50 deg. below zero. Strawberries, converted into bricks, each about the size of a pound of butter, and as hard as marble, are then shipped to cold storage plants without a loss.

The job complete, the portable factory, mounted again on the five-ton truck, takes its leave, promising to call again in another year, unless, of Turn to page 46, please



Uncle Sam Evaluates Truck Bids On Points

NEW method of buying trucks has been recommended for the Federal Government. It is an evaluation method of arriving at the lowest bid. In it price is removed as a major factor and made one of 19 value elements, all of which are graded according to their importance. The plan is largely the work of the Federal Specification Board Sub-Committee on Motor Vehicle Specifications, and is the offspring of circumstances which hampered the government's effort to buy trucks on the same free and independent basis as private users. The method has much to commend it, and is worthy of the attention of all fleet operators desirous of finding some yardstick by which to intelligently measure the value of a truck before buying.

Since time immemorial, purchases by the Federal Government have been on price, the low bidder, provided he meets specifications, getting the award. A very simple and equitable plan. But in this, many truck-using Federal departments do not agree. The plan, they say, makes it difficult to secure the best value for best price at one and the same time. The hitch in the system centers in the requirements of specifications. If the specifications are made sufficiently broad to include a large group of competitors, varying grades of trucks are admitted, which, of course, eliminates selection on a merit basis, as the award goes to the lowest bidder, which may or may not be good value for the money. On the other hand, if rigid (closed) specifications are prescribed, a lot of good competition is automatically eliminated and the opportunity of buying maximum value at minimum price is sacrificed. Intelligent buying with this set-up, obviously, is impossible.

The purchase of trucks under the new method follows identically the same preliminaries as formerly, which, briefly, consists of two steps:

1. Description of the work to be performed and specification of such details as are necessary to secure a truck suitable to perform the service in which it is to be used. This consists of several pages of specifications divided into major unit groups.

2. Bidders must furnish with their bids a filled-in questionnaire of the



truck offered under the bid. This questionnaire, which also covers several sheets, gives the items listed in the general specifications as advertised and in addition the manufacturer's specifications in detail in order to more completely describe the vehicle offered. It is most comprehensive, embodying full details on all major units listed under more than 20 classifications. The excerpt on page 46

Gets Greatest Value for Money by Weighing 19 Truck Elements

BY MARTIN J. KOITZSCH

gives an indication of the completeness of the data.

When all questionnaires are in, the purchasing department is prepared to determine the lowest bid by the evaluation method. The yardstick used is a chart composed of 19 elements of value having a total maximum grade of 1000 points. The point Turn to page 46, please

EVALUATION CHART

Points per

C Front axle 7 D Clutch, trans., etc. 7 E Tires 7 M Frame 3 N Body needs 3 R Accessories, etc. 2 Rating 7 C Chassis wgt. 5 K Payload cap. 6 L Gross wgt. 7 C Capacity of plant and ability to make prompt delivery 7 C Past performance of bidder 8 Number of similar trucks manufactured and sold 7 Service Facilities H Efficiency in repair parts service 1 L Location of service facilities Price F First cost O Price of repair parts	emei	
B Rear axle 9 C Front axle 7 D Clutch, trans., etc. 7 E Tires 7 M Frame 3 N Body needs 3 R Accessories, etc. 2 Rating J Chassis wgt. 5 K Payload cap. 4 L Gross wgt. 4 Reputation 6 Performance record of similar equipment 9 P Capacity of plant and ability to make prompt delivery 9 Past performance of bidder 5 Number of similar trucks manufactured and sold 3 Service Facilities H Efficiency in repair parts service 1 Location of service facilities 9 Price F First cost 0 Price of repair parts 3		
C Front axle D Clutch, trans., etc. 7 E Tires 7 M Frame 3 N Body needs 3 R Accessories, etc. 2 Rating J Chassis wgt. 5 K Payload cap. 4 L Gross wgt. 4 Reputation G Performance record of similar equipment 9 P Capacity of plant and ability to make prompt delivery 9 Q Past performance of bidder 5 Number of similar trucks manufactured and sold 3 Service Facilities H Efficiency in repair parts service 1 Location of service facilities 9 Price F First cost 0 Price of repair parts	00	
C Front axle D Clutch, trans., etc. 7 E Tires 7 M Frame 3 N Body needs 3 R Accessories, etc. 2 Rating J Chassis wgt. 5 K Payload cap. 4 L Gross wgt. 4 Reputation G Performance record of similar equipment 9 P Capacity of plant and ability to make prompt delivery 9 Q Past performance of bidder 5 Number of similar trucks manufactured and sold 3 Service Facilities H Efficiency in repair parts service 1 Location of service facilities 9 Price F First cost 0 Price of repair parts	8	
D Clutch, trans., etc. 7 E Tires 7 M Frame 3 N Body needs 3 R Accessories, etc. 2 Rating J Chassis wgt. 5 K Payload cap. 4 L Gross wgt. 4 Reputation 6 Performance record of similar equipment 6 P Capacity of plant and ability to make prompt delivery 9 P ast performance of bidder 5 Number of similar trucks manufactured and sold 6 Service Facilities H Efficiency in repair parts service 1 Location of service facilities Price F First cost 0 Price of repair parts	78	
E Tires M Frame 3 N Body needs 3 R Accessories, etc. 2 Rating J Chassis wgt. K Payload cap. L Gross wgt. K Payload rop. C Gerformance record of similar equipment F Capacity of plant and ability to make prompt delivery P Past performance of bidder Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts	74	
M Frame N Body needs R Accessories, etc. Rating J Chassis wgt. K Payload cap. L Gross wgt. Reputation G Performance record of similar equipment P Capacity of plant and ability to make prompt delivery Q Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts	72	
R Accessories, etc. 2 Rating J Chassis wgt. K Payload cap. L Gross wgt. 4 Reputation G Performance record of similar equipment P Capacity of plant and ability to make prompt delivery Q Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts	36	
R Accessories, etc. 2 Rating J Chassis wgt. 5 K Payload cap. 4 L Gross wgt. 4 Reputation G Performance record of similar equipment 6 P Capacity of plant and ability to make prompt delivery 9 P ast performance of bidder 7 S Number of similar trucks manufactured and sold 7 Service Facilities H Efficiency in repair parts service 1 Location of service facilities Price F First cost 0 Price of repair parts	34	
J Chassis wgt. K Payload cap. L Gross wgt. Reputation G Performance record of similar equipment P Capacity of plant and ability to make prompt delivery O Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts		517
J Chassis wgt. K Payload cap. L Gross wgt. Reputation G Performance record of similar equipment P Capacity of plant and ability to make prompt delivery O Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts	_	
Reputation G Performance record of similar equipment P Capacity of plant and ability to make prompt delivery O Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts	50	
Reputation G Performance record of similar equipment P Capacity of plant and ability to make prompt delivery Q Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts	49	
Reputation G Performance record of similar equipment P Capacity of plant and ability to make prompt delivery Q Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts	41	140
G Performance record of similar equipment P Capacity of plant and ability to make prompt delivery Q Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts	-	140
ilar equipment P Capacity of plant and ability to make prompt delivery O Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts		
P Capacity of plant and ability to make prompt delivery Q Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts		
ity to make prompt delivery O Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts	60	
ity to make prompt delivery Q Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service I Location of service facili- ties Price F First cost O Price of repair parts		
O Past performance of bidder S Number of similar trucks manufactured and sold Service Facilities H Efficiency in repair parts service	29	
S Number of similar trucks manufactured and sold 2 Service Facilities H Efficiency in repair parts service !! I Location of service facilities !! Price F First cost O Price of repair parts	26	
Service Facilities H Efficiency in repair parts service I Location of service facili- ties Price F First cost O Price of repair parts		
H Efficiency in repair parts service I Location of service facilities Price F First cost O Price of repair parts	24	139
Price F First cost O Price of repair parts	_	
Price F First cost O Price of repair parts		
Price F First cost O Price of repair parts	52	
Price F First cost O Price of repair parts		
F First cost O Price of repair parts	51	103
F First cost O Price of repair parts	_	
O Price of repair parts	71	
	30	101
W . I . A		101
Total 10	00	1000

Engineers Flash Caution Signal on New Balloons



HE new low pressure balloon tire first introduced in the replacement field for passenger cars and now optional equipment on several makes of cars has won some acceptance in the commercial field in vocations such as radio, bakeries, and egg dealers, where road impacts and vibration are important factors to be considered.

Present happenings, however, are dwarfed by speculation about the future of doughnut tires. Public acceptance of the new tires has put engineers at passenger car and tire factories in a furor. They fear a stampede for the tires which will force widespread adoption before engineering difficulties can be overcome.

Both formal and informal statements made at the summer sessions of the S.A.E. at White Sulphur Springs show that engineers are fearful of the consequences of hastily rushing to extreme low pressures without regard to problems involved in such a change. Some of the engineers most vehement in denouncing too early acceptance of low pressure balloons are convinced that the public may force their hands. Several truck engineers attending

the S.A.E. meeting made no attempt to conceal their joy over the fact that the first worrying over the situation will be done by passenger car and tire engineers. Truck engineers have another reason for contentment. There is little likelihood that ballooning will be carried as far on trucks as on some passenger car installations. Conventional balloons for passenger cars carry 32 lb. pressure in four-ply types and 36 lb. in the six-ply types. Truck balloons start at 40 lb. for the 5.20/20 and end at 95 lb. for the 13.50 in. tires. All the fuss and bother in the passenger car field is about reducing pressures from 32 lb. to 16 lb. Therefore a similar program in the truck field would not drop pressures, for the present at least, below pressures well established in the passenger car field.

Lowering tire pressure to the extent proposed for passenger car sizes and actually applied in replacement installations brings in its wake problems of magnitude. Some of the early Sense Danger to Balanced Design if PublicDemandStampedes Factories to Adoption

doughnuts applied to Ford, Chevrolet and Plymouth cars were 9.00 in., which are rated to carry 1090-lb. load at 16 lb. pressure in the new experimental practice load and inflation table for low pressure balloon tires for passenger cars adopted in May by the Tire & Rim Association, Inc. Advertised weights of these cars are 2800 lb. or less and it is evident that the 9.00 tire (seven sizes larger than standard equipment) will be carried at less than 16 lb. pressure on these cars. More conservative applications were made, using a 7.50 in. tire and many tire men feel better satisfied in recommending a 6.50 in. low pressure balloon which is a triple oversize.

The subject of super-balloons was discussed during the S.A.E. meeting by B. J. Lemon, field engineer, tire development department, United States Rubber Co., in a paper which was one of the high spots of the sessions. Discussion of it was active during the session and afterward. Informal talks with engineers of car factories and tire companies explain their personal reasons for opposing a too rapid adoption of doughnut tires without a proper background of research and development work.

Major objections to doughnuts, especially when extreme sizes are employed, as expressed by engineers are:

1. A definite lag in steering.
2. Instability due to the fact that wheel hubs are free to move within circumference of the tire an inch or so in three dimensions.

3. Springs, brakes, in fact many important features of design, must be changed to accommodate the new style

Lag in steering and a peculiar form of instability which results in a jiggling action of the body are worrying a large percentage of the engineers interviewed on the subject of doughnut tires. They recognize the action as symptoms of a cause which they are powerless to remove. The lag in steering, they point out, exists because the doughnut tires possess a relatively larger road contact area than do ordinary balloon tires and,

S.A.E. GROUPS CONSIDER PROBLEMS OF INDUSTRY

Interest Centers in Uniform Code, Military Transport, Front Alignment and Brakes

RUCKS predominated in committee meetings held during the summer sessions of the Society of Automotive Engineers at White Sulphur Springs, W. Va., June 12 to 17. It is casting no reflection upon the excellent program of papers presented to say that the committee deliberations rivaled in interest the technical program.

Seven of the committee meetings were devoted to subjects of interest to both passenger car and truck owners, three were devoted to truck matters, and one, the riding comfort research sub-committee, was in the field of passenger car engineering.

Ranking, in truck interest, second

Ranking, in truck interest, second to the motor truck rating committee (an account of which is given on page 14) was the Automotive Transport Code Committee. The Society of Automotive Engineers is now a member of the Motor Vehicle Conference Committee which, as is known, is working on a uniform motor vehicle code. At a meeting of the Motor Vehicle Conference Committee in New York City in June, it was suggested that the S.A.E. Automotive Transport Code Committee recommend definite limitations for motor truck dimensions and weights which could be included in the code and that the S.A.E. committee might bring together the work of the Bureau of Public Roads and of the American Association of State Highway Officials applicable to the preparation of a code.

The committee members present decided upon definite recommendations for width, height and length of single vehicles and total length of combinations, and also approved recommendations for maximum axle weight limitations to be used in place of limitations of gross weight and inch width of tires. They also proposed that the definition of "Single Unit" be applied to a motor truck, tractortruck, semi-trailer or trailer, thus clearing up confusion in terms men-tioned by Thomas H. MacDonald, Chief, Bureau of Public Roads, before the Eastern Conference of Motor Vehicle Administrators and reported by James W. Cottrell in his paper on Trailers

REAN PROPERTY OF THE PARTY OF T

A copy of proceedings of the committee meeting at White Sulphur Springs has been sent to the full membership of the committee for approval or disapproval. Committee reports and recommendations are to be transmitted to a meeting of the Motor Vehicle Conference Committee.

The Military Motor Transport Advisory Committee made a progress report to Col. Brainerd Taylor, Motor Transportation Branch Quartermaster Corps, U. S. A., who attended the meeting. Sub-committees of the Advisory Committee are working on problems of interchangeability of various units which may be used by the Quartermaster Corps procurement program in time of war. No formal report will be made until all subcommittees have completed their activities, but much was accomplished by an informal exchange of ideas and reports of progress to date.

The Highway Research Sub-committee has before it an ambitious

program in which utilization of highways is a major part. The committee approved reports of impact tests by the Bureau of Roads and they will be published by the bureau, it is understood, in the near future. The tests include observations made on trucks running on ordinary roads, supplementing tests previously published showing impacts of solid tires, after passing over artificial obstructions.

The sub-committee on front end alignment which has been seeking a standard of camber, caster and toe-in applicable to all passenger cars decided that the standards could not be set up at this time, but they decided to make one more try before giving up the task. As a result of this decision a questionnaire will be sent to manufacturers asking for data on front end alignment on 1932 cars.

The committee also decided that it was not advisable to set up recommendations for a standard method or mechanism for measuring camber and caster.

Power brakes for trucks and trailers were discussed in the motor truck and motor coach general session at Turn to page 36, please

Engineers Flash Caution Signal on New Balloon

CONTINUED FROM PAGE 22

therefore, tend to maintain a straight course. When a driver, wishing to turn to right or left, pulls on the steering wheel the steering knuckles and hubs begin to swing around while the tire treads still continue in a straight line. A driver accustomed to ordinary tires may give the steering wheel a yank and as a result he oversteers. A little experience in driving will overcome the tendency to oversteer but the steering lag remains. The larger the tire and the lower pressure of a tire for a given load, the greater is this steering lag. In sudden turns to avert collisions the lag is a serious disadvantage in the opinion of several engineers.

Allied in cause with steering lag is instability of both front and rear axles. The same softness which makes it possible for doughnut tires to "swallow bumps" makes it possible for the wheel hub to move up or down, forward or back, or from right to left without appreciably deflecting the tire on its course. Inasmuch as this is a movement of axles, and of hubs, in relation to the road surface it cannot be directly controlled by shock absorbers between axle and car frame.

"Left Rudder"

Another effect of axle movement within the circumference of tires is experienced when driving on a crowned road, according to several engineers. When driving on the right side of a crowned road axles are displaced sidewise in relation to the tire treads, and the driver must use "left rudder" all the time to keep the vehicle on a straight course. When the vehicle crosses over the crest of the road the sidewise displacement changes to the left and the vehicle swings too far because of steering lag and displacement of the longitudinal axis of the vehicle in relation to the axis of the tire contact surfaces, on either side. This requires a new driving technique, and several observers claim that driving down the center of a highly crowned road with large-sized doughnuts is difficult.

J. C. Tuttle, Goodyear, commenting upon stability of tires themselves, said, during the discussion of Mr. Lemon's S.A.E. paper, that: "The 9.00 tire must have about 18 lb. air pressure for stability. And if 18 lb. pressure is used, we do not need a 9.00 tire for a light car. It is better to use a smaller amount of rubber, say a 7.50 tire."

Interest in the safety of doughnut tires in the hands of the automobiling public is not confined to tire and car engineers. "Highway officials who viewed free wheeling with alarm have become excited over the dangers of super-balloons. They fear harder steering, roll-off of tires on turns, sudden blow-outs and other possibilities

for accident increase," according to Mr. Lemon's paper.

Front-end troubles may be merely an annoyance, or they may be a positive menace, according to their degree. Mr. Lemon reported that quite a lot of front-end trouble developed on some vehicles and very little on others. He reported also that corrective measures by engineers or expert service station mechanics produced a reasonably acceptable ride at rather low air pressures. Mr. Tuttle's experience with changeovers to doughnuts was not so satisfactory; he said that some of them "gave frontend trouble that we have not been able to overcome."

What will happen when a doughnut tire blows at high speed on a turn is a question which is worrying engineers, but they are withholding final judgment pending operating experience. Experimental tests have been made by means of holes blown in tire side walls by cartridges, but the all-important question is what will happen when the blow-out occurs with vehicles in the hands of drivers who are not test pilots and have no warning when the tire will let go.

The customer is always right, and if doughnut tires appeal to the public, engineers will be forced to meet the demand. That the forcing will bring about hasty changes is recognized by Mr. Lemon. As he expressed it, "emergency changes are in order for the immediate future, and a more complete car redesign is predicted for the not-very-distant future."

Engineers see a lot of complex problems in the making of either the emergency changes or the complete car redesign. Discussion of problems of steering-gear design were not confined to engineers specializing on this unit. There was general agreement that doughnut tires are harder to turn when the vehicle is stationary, as in parking. In itself this is a small matter. Steering gears are available in the truck field which can turn the most reluctant front tire.

Steering Problems

But mere power is not all of the problem when designing steering gears to suit doughnuts. The steering gear desired probably would have a higher numerical ratio and higher general efficiency in order to reduce the pull required on the rim of the steering wheel. So far so good. Front-end difficulties suggest the need for a steering system with a relatively high dampening effect, which calls for friction rather than high efficiency. Ability to turn quickly favors low numerical ratios in the steering gear. A prominent engineer sums up the situation by saying: "We can lick steering by making gears of high overhaul efficiency, but I do not see how we can make a steering gear which is both very efficient for parking and full of friction for road work."

The fight between tires and brake

drums for room was on before doughnut tires came along to make matters worse. Chris Bockius of Raybestos-Manhattan, Inc., states: "It is apparent that the design of brakes will undergo a radical change, especially for the heavier cars, due to the smaller size of rims required by coming development in tires, which may limit drum diameters to 13 in. or, at most, 15 in. If such a trend and design is coming for the larger cars, may not 10-in. diameter drums, or less, be applied to the lighter cars, possibly for economic reasons solely?"

Austin M. Wolf boldly predicted at White Sulphur "that the service brake will have to be removed from the rear axle, for lack of sufficient space, and to take unsprung weight away from the axle. Then the propeller-shaft brake will be the proper type to use, and it could be built into a unit with the free-wheeling device."

Braking Torque

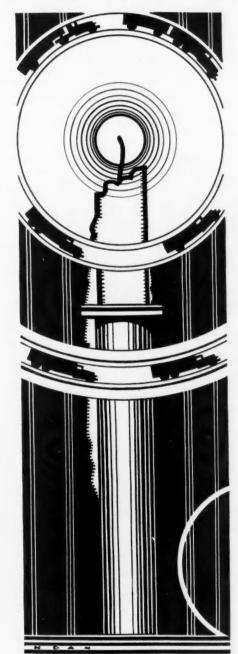
Better traction, which is generally admitted as one of the advantages of the doughnut tires, gives increased braking possibilities, and therefore will impose greater stresses on brake mechanism. Figures for coefficient friction between tire and road cannot be applied directly to the large ground contact area of doughnut tires. The tire actually envelops road inequalities, and resistance to sliding wheels when brakes are applied hard takes something of the nature of gearing instead of plain friction. If this condition is employed to bring about exceedingly rapid deceleration, it is obvious that high braking torque will be developed.

The same quality of doughnut tires which gives them greater traction also improves their resistance to skidding. As Mr. Lemon observed, "the larger tire tread contact area and lower unit pressure reduces the likelihood of the tire jumping sidewise, and thus losing maximum friction contact with the road surface.

The effect upon top speed, acceleration and rolling resistance of doughnut tires is of vital concern to fleet owners. Tests on passenger car sizes of tires, reported by Mr. Lemon, indicate that the rolling resistance of doughnut tires "appears to be slightly greater for the larger tires than for standard balloon. He reports that the time required to coast from 30 to 20 m.p.h. with standard, 5.25/18, four-ply tires, was 14.9 sec., and that the same car, carrying 7.50/15, four-ply doughnuts, inflated to 20, 15 and 12 lb. air pressure required, respectively, 17.3, 16.4 and 15.6 sec. for the same coasting. Top speed was increased slightly, probably due to the larger over-all tire diameter.

Gasoline consumption was increased 0.2 miles per gal. at 25 m.p.h., and 0.35 miles per gal. at 45 m.p.h. by the use of 7.50/15 doughnuts, inflated to 22 lb. instead of 6.00/17 balloons at 32 lb.

WHEN SHOULD A PIECE OF EQUIPMENT BE RETIRED?



HEN is a motor vehicle old? That question, like politics, can be argued for days, weeks or years, without getting you any place except a mile or two closer to the bughouse. Some fleet operators begin to think of their vehicles as old when they wobble senilely down the street like klunking junk wagons, with noisy engines, squeaky chassis, parts dropping out now and then, and a few other faults. On the other hand, some fleet opera-

Large Fleet Operator Uses Chart to Compare Cost of Obsolescence and Operation of Old Vehicles Against New Equipment

By W. E. FRAZER

Fleet Operator

tors give their vehicles the "air" while the paint still shines.

The problem, apparently, has not been given the deep study that is its due. The replacement of old vehicles is a most important factor in the old cost sheet, where we're all trying to shoot par or under, and if you don't believe it, give a look at what's going to follow.

Why do we retire our old vehicles? Because they are no longer profitable to own. And they cease to turn up a profit because they are either obsolete, or their operating cost is climbing too high, or because a change in the character of work makes them impractical for that particular use.

Perhaps one of the principal reasons why insufficient attention has been paid to retirement in the past by the majority of fleet operators of certain classes is that practical retirement cannot be accomplished without an adequate cost system. Unless you know how much your operating costs are increasing with each added thousand miles of travel or each added year of life, you're in a dark room without lights.

A regular replacement program can be inaugurated the same as we inaugurate oiling and greasing schedules, or any other scheduled operations, if the matter is gone about properly. Replacements vary with local conditions, type of service, type of vehicle, etc. You cannot just look at the whole fleet and promise you'll retire each one when it gets four or five years old, or has covered 20, 30 or 40 thousand miles. The first thing you've got to do is to make a proper division of types or classes of vehicles, assuming that you already have an adequate cost accounting system in use. One divisional classification which is satisfactory under average operating conditions is (a) passenger and light truck, (b) \(^34\)-ton to 2\(^12\)-3-ton truck, and (c) ton trucks and above.

These classifications can then be sub-classified as to work types, such as long-distance daily freighting, sand and gravel work, light city delivery,

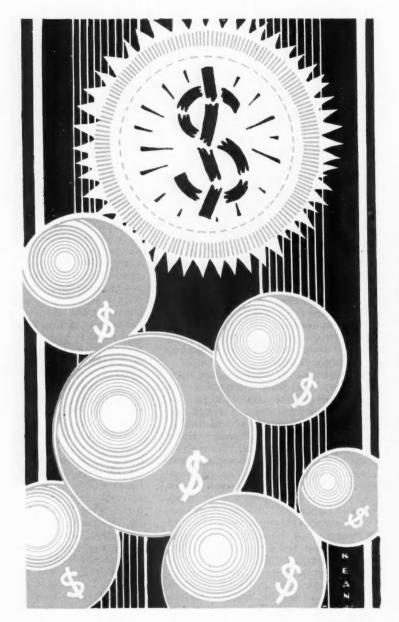
heavy construction work, etc. After a thorough analysis of the vehicles and work performed in the fleet it will be necessary to set up an arbitrary depreciation rate, based either on monthly life or miles of travel, or a combination of the two, for charging off each month, so that at the end of the period of time or travel the ac-count will show the truck entirely depreciated on the books. Whether or not you replace the vehicle at that time depends on your local conditions, including the mechanical condition of the vehicle at that time. But the point here is that you have now reached a point where the matter of replacement is brought to your attention for serious consideration and a decision. Such a system is bound to cause you to give more serious thought to the replacement than if you had just let it slide along without knowing that a truck's estimated life had been lived.

After studying replacements of vehicles for several years, it is my opinion that the early replacement of vehicles will be favored over the late or delayed replacement. The use of vehicles after they begin to show steadily increasing operating expense, or after they have become obsolete or require considerable overhauling, just to save on the initial capital outlay of a new vehicle, is not economy in large fleets. The only man who can possibly afford to keep his trucks on the road for seven or eight or nine years is the small operator with his halfdozen or so vehicles which, by diligent care, can be made to operate on a fairly economical basis.

In our fleet, replacements are budgeted practically a year in advance, every year, because conditions can usually be fairly accurately forecast. This may not be true, however, in many fleets in other lines of business.

In the fall of every year we select all the vehicles which have completely or almost completely depreciated out on the books. These are inspected as to mechanical condition, their age and mileage noted, and their yearly oper-

INFLATED LIST PRICES SHOULD BE EXPLODED"



And Absurd Allowances on Obsolete Trade-ins Should Be Discontinued

SAYS J. R. BINGAMAN

Former President Pennsylvania Motor Truck Association

Lack of stability within the industry is reflected to the greatly inflated list prices of trucks. This practice permits salesmen a wide range of bargaining to accomplish a sale and still give the builder a profit. I attribute this evil to a lack of cooperation between manufacturers and to the unethical practices of salesmen, whose only objective is commission. The sale once made, his interest is immediately transferred to another sale. He conveniently forgets the manner in which future payments are to be obtained.

When a purchaser seeks to buy any article from a suit to a steam shovel, with very few exceptions, he is quoted a price, which he must take or leave—but when a truck is considered, the first price is a feeler and the operator knows it and proceeds to name his own figure. This is harmful to the entire trade.

Trade discounts for obsolete equipment are not only absurd but another lamentable evil in the truck business. No consideration is given to the actual scrap value of such equipment yet ridiculous discounts are granted with small down payments and long terms for new equipment. The reply will be that this is the operator's fault, as we force it. We can't force tire manufacturers, gas and oil companies to chisel prices. If manufacturers of trucks were as steadfast; would formulate a policy and stand or fall on it as real men, the entire trucking situation would be benefited thereby. An appraisal manual of second hand trucks should be prescribed and lived up to. The second hand market is the damnation of the business and should be abolished. Second hand trucks should be scrapped-not resold-and proper profit made on all sales of new equipment with no thought of disposal of trade-ins.

TURN TO PAGE 47, PLEASE

HIS article is written because I believe that good results can be accomplished only by plain speaking. In pointing out the faults of truck manufacturers I do so in a spirit of helpfulness and in an effort to help manufacturers realize that it is to the operator rather than the bank that they owe the closest cooperation.

Many years experience with factory policies regarding price and quality of product has led me to take a definite stand against their ethics in relations with operators. I wish to charge: that truck manufacturers have made little or no attempt to stabilize their in-

dustry by abolishing the evil practice of inflating list prices; that they do not comply with the laws of the several states relative to width and weight restrictions; that they ignore many worth while developments for incorporation into truck design until forced to it by operators or small independent builders; and that they have assumed, contrary to any desire upon the operators, a guiding hand in consideration of State and Federal laws concerning strictly operating features. I do concede to them, however, the right to become interested in regulation which pertains to taxation.

CONFIDENCE GAME TRICKS SHIPPER, HAULER & TRADE

Freight Hauliing Racketeers Grip Chicago and Spread Their Activities

UT of the Mid-West comes news of a racket which is victimizing truck operators, shippers and the truck trade. Chicago, according to reports, is in the throes of the racket. That the racket is spreading is evidenced by information from the Pittsburgh area.

In Chicago, the racket drew down the righteous wrath of the Illinois Motor Truck Operators Association. In an effort to stop this vicious confidence game at the source of motor freight, which is the magnetic pot of gold with which the racketeers lure their victims, Walter E. McCarron, manager of the Illinois operators' group, addressed an open letter to every firm in Chicago that ships merchandise. The letter was a complaint, a warning and an anneal

a warning and an appeal.

"Wild-cat, questionable, illegitimate operators," it said, "have invaded another field of honest business in Chicago—this time in the guise of motor truck selling agencies and spurious trucking or transportation companies. Already their abusive, nefarious methods have robbed reputable trucking concerns of the opportunity to compete decently. Through a class of competition which no honest, reputable firm can meet, they have helped fill the streets of Chicago with honest, deserving truck drivers whose work has stopped because of this abominable condition."

Then the letter explained how these "modern brigands of business" operate. The explanation corresponds to one which COMMERCIAL CAR JOURNAL received from a truck manufacturer regarding the same form of racket as practiced in the Pittsburgh territory. Briefly here is the racket:

The unscrupulous freight broker approaches the motor truck dealer or factory branch, stating he has an individual who desires to purchase a truck to engage in hauling for his company. This order, he states, will be placed if the motor truck dealer or branch will agree to charge the individual the full list price and pay 20 per cent commission direct to the



freight broker. The individual usually is inexperienced and has been induced by the freight broker to make a satisfactory down payment either from personal savings or loans from friends, holding out as bait the lure of lucrative work, on long term contracts, for the truck or trucks so purchased.

The freight broker obtains hauling contracts for the truck at freight rates or a little less, and pays the individual whom he has victimized 20 to 40 per cent less than this amount. The broker also deducts the cost of in-

surance, gas, oil and tires on which a further commission is paid to the broker.

The net return then to the pitiable individual truck operator is therefore usually much less than the cost of operation and the truck is soon repossessed and the individual loses his investment.

The freight broker usually has a few haulers who receive preference in terms and loads which permits them to operate successfully and assures the broker a few trucks on which he Turn to page 60, please

A WORD ABOUT OVERHEAD

◆WHEN THE BUSINESS DEPRESSION HAS passed and become only an incident to which you refer humorously when your grandchildren ask you how you acquired your grey hairs and the odd habit of casting a quick glance over your right shoulder as if looking for a sheriff, we hope some effective means is devised of keeping automotive executives reminded of the vital importance of "overhead."

There is a word denoting a condition which has had more attention focused on it since business developed hardened arteries, than any other. Wherever we go we meet dealers, distributors and branch men who invariably shake their heads sorrowfully and say, "If only I didn't have this overhead." The futile "if" implies that they would be a whole

lot better off if.

There is no doubt that fixed overhead, consisting of bricks, concrete, steel girders and property taxes, is causing more headaches today than bad booze. The headaches vary, of course, in severity. The black-spots-before-the-eyes variety goes to the dealer with a pretentious establishment in the high-rent district; the splitting variety goes to him who wisely picked a low-rent district but unwisely sank too much money into the building, and the ordinary throbbing type is being borne by the dealer who, although he built a very modest establishment in a side street, finds even that too much for him under present conditions.

This is a topic on which anyone familiar with conditions can talk for hours without once repeating himself but on which everything he said would be so obvious and so generally realized that it would not be unjust to suspect him of the vicious practice of "rubbing it in."

Personally we content ourselves with the hope that the overhead lesson taught by the depression will not be forgotten by the automotive industry when dinner pails report for duty loaded with two chickens. And to preserve this memory we suggest, facetiously, that every automotive gathering be opened with two minutes of silent meditation on overhead, and, seriously, that head men everywhere have constantly before them a neatly framed motto reading—no blasphemy intended: "Overhead, hallowed be thy name."

Two Words on Service

◆BUT BEFORE WE CRAWL COMPLETELY out of the pulpit we pause for a moment to speculate whether it is worry over such things as overhead that makes the trade overlook such things as the money that can be made in the service department.

In New York recently we talked with a dealer who admitted that when car and truck sales poured in he looked upon the service department as a necessary evil. There came à time, however, when sales dried up to mere drops that couldn't

AFTER



HOURS

possibly wash up his organization expenses. It was then that he turned upon his service department the genius for management and merchandising which previously he had squandered entirely on sales. And in a short time he had the service department out of the red and handsomely in the black. "At this moment," he said, "if it weren't for the service shop I'd have to board up the front door."

In another city we visited half a dozen branch managers. We turned the conversation to service and every one of them admitted that service business was satisfactory, and that parts sales were equally so. They also admitted that their shops were kept busy only part of the time. And yet only one of them admitted that he was doing anything special to bring in more repair work.

We gathered that contacts between the service department managers and fleet operators were only as occasion demanded; there was no specific effort to interest fleet operators in sending in more of their business; no organized activity of the parts department to sell more parts. And knowing this, out of consideration we discarded as useless a question we had intended asking: "What are you doing to help your dealers organize their service departments on a more efficient and profitable basis?"

What about the exception who was making an effort? Well, he had altered a long-established policy and was soliciting all makes of trucks; he was prepared

to give night service, and he had turned his mechanics into service salesmen. He arranged to pay mechanics 5 cents a mile as traveling expenses. When they were idle they hopped into their cars and went out among truck operators to sell service. These men—confronted with the responsibility of keeping themselves busy—were producing work that would have been neglected or would have gone elsewhere.

All this makes us wonder when, if it doesn't do so during a business slump when the natural tendency should be to put everything on an efficient basis and to realize its full potentialities, the service shop will become a department which the dealer, distributor and branch can proudly point out as a good profit maker.

PROGRESS IN RATING

◆ Adding, as it does, two figures—grade ability and speed—not previously included in either tonnage or vehicle gross weight ratings, the new Reo three-part "Ability Rating" is a noteworthy milestone in progress in rating trucks. In no sense a formula, it represents the maker's statement of exactly what may be expected of any model, in fact, of an individual truck.

The first figure is the maximum gross weight and it includes the maximum load which the chassis can carry with long life and economy. The second figure shows the grade the truck will climb in high gear with the load, tire size and gear ratio specified. Speed of the truck, loaded, on average level road, with tires and ratio as before, is the third figure. These are definite statements, not guesswork or estimates.

Readers will recognize in the Reo ability rating one of the forms proposed to the S.A.E. truck rating committee. Ratings of this kind are based upon manufacturer's statements and guarantees. They can be checked by purchasers and other outside parties but they cannot be figured or determined by others. Whether truck factories should fix their own ratings or whether ratings should be figured by formula or determined by an outside neutral agency is a question which has been before the S.A.E. committee and still is before them, as explained in the article on p. 14 of this issue.

Do You WANT A JOB?

◆ THE COMMERCIAL CAR JOURNAL OFFERS its services to the many good men in the truck industry who are unemployed through no fault of their own and no fault of their former employers—both victims of economic distress.

The need for such an offer occurred to us when we received a letter from the Department of Commerce. The letter said that "following his radio talk of May 15, which dealt with the present availability of hundreds of very able white-collar employees, Dr. Julius Klein Opposite page, please



THE OVERLOAD

"Hole" Everything!

Fred Black, advertising manager of the Ford Motor Co., has entered the select list of holers-in-one. Mr. Black displayed his golfing prowess on the Dearborn Country Club course. Those unprincipled skeptics, who habitually shoot over a hundred, and who insist upon sworn proof should apply for affidavits to A. R. Barbier, assistant advertising manager of the Ford company, and E. E. (Doc) Elder, Detroit business representative of Commercial Car Journal.

How Model Numbers Are Born

How Model Numbers Are Born

W. E. Niness, sales engineer of Fuller & Sons Mfg. Co., Milwaukee, makers of Fuller transmission, has submitted his contribution to prove that the model numbers of assembly units don't just happen, but that like Topsy, they just growed. Here 'tis: "I believe, we have a logical explanation for JVUOG. When we brought out our first five-speed transmission to mount as a unit with the engine, we used the Roman number 'V' to indicate five and the letter 'U' for unit, resulting in the symbol 'VU'. A demand for the transmission with an over gear ratio resulted in a similar unit designated by the same symbol with 'OG' for over gear added to it, making the complete symbol 'VUOG'. We later brought out smaller series, a prefixed 'J', presumably for junior, to designate them. Thus the small five-speed unit over gear model has the symbol 'JVOG' which came up for discussion in your column."

Nickel Topics Free

If you have an insatiable craving for technical and semi-technical information dealing with nickel alloy steels, you may appease your craving by getting yourself on the mailing list of Nickel Steel Topics. Drop your request to the International Nickel Co., New York City.

Rubber Checks Accepted

Another publication you should write for is the combined bearings service catalog of New Departure and Hyatt. In its complete automotive coverage it includes commercial vehicles from 1926 to 1932, inclusive. And you'll see truck names that will revive memories of "the old days when." Drop your request to old days when." Drop your request to United Motors Service, Detroit, Mich.

S.A.E. SUMMER MEETING NOTES

A Cartoonist's Child!

Bud Fisher, creator of "Mutt and Jeff," predicted the doughnut tire ten years ago. He used a drawing of a large tire mounted on a hub without a wheel to illustrate the joke about a tire "flat only on the bottom." The drawing was thrown on the screen during the tire meeting, causing one engineer to ask if cartoonist's ideas must be followed in tire design.

A One-Stop Brake

"One high speed stop and a light stamped brake drum are gone," charged one discusser during the brake meeting. Another added no joy by showing that "Organic matter in lining will be destroyed at 500 degrees and that brake temperatures go above that point. Asbestos fibers suffer at 800 degrees." Proving that brake design is no child's play.

Kicks Out Pet Ideas

Maximum blowby takes place not with high combustion chamber pressures but when passing from open to closed throttle position and during idling. Harry M. Bramberry, Perfect Circle Co., thus kicked the props out from under a lot of well established ideas about piston rings. He said that measuring ring pressure 90 deg. from the gap means little because "the most important part of the ring is the logint."

Night Parkers Beware!

A vehicle parked with headlamps on full is the worst dazzle and glare offender on

the highway. A driver can remember what is ahead as seen before the lights of an approaching car temporarily blind him, until the car passes. He does not get a chance to see the road beyond the parked vehicle. Experts of the Bureau of Standards spent more than 200 nights peering into darkness and oncoming headlights. They found that contrast in brightness between vehicle headlights should not exceed the ratio of two or three to one.

Vacuum is Air Backwards

Life of air brake system compressors is less if the compressor is in the air stream from the cooling fan, said J. F. Winchester, Standard Oil Co. of N. J. M. C. Horine, Mack, labeled both vacuum and air brakes as air brakes, the former low pressure, the latter high pressure.

Shimmy-"Torso" Vibration, etc.

Shimmy—"Iorso" Vibration, etc.

Shimmy, of both low and high speed variety, and other carryings-on of front ends of automobiles are symptoms of a torsional vibration of the entire chassis about a longitudinal axis, and this vibration cannot, in many instances, be sufficiently corrected by even major structural reinforcement of the frame, said Clyde R. Paton, chief engineer, Packard. Pedometers, the watchilke instruments used to show the distance a person walks, are being employed by factory engineers to record vibrations of chassis parts. Mounted on radiators, dashboards, cowls, etc., they count the number of times they are shaken. From their use engineers are discovering many facts about vibration of chassis parts supposedly stationary.

Do You WANT A JOB?

CONTINUED FROM PRECEDING PAGE

(Assistant Secretary of Commerce) has received a letter from the president of a motor truck company in which the latter states that he would like to be put in touch with really high grade domestic retail truck salesmen."

Our decision to do something about the matter was spurred by two facts: first, the knowledge that a factory president was making an effort to attach high grade salesmen to his organization, and second, the fact that for years salesmanagers, when we asked them how we could be of greater help to them, invariably replied, "For heaven's sake, tell me where I can get good salesmen." In those days our invariable reply was, "Good salesmen all have jobs. Your only hope is to take raw manpower and mold it into good salesmen."

But today we can give a more satisfactory reply to those salesmanagers. In order to do so, however, we must have the cooperation of good truck salesmen and sales executives who are unemployed. This cooperation consists simply of furnishing COMMERCIAL CAR JOURNAL the following particulars: Name, Age, Mail Address, Number of Years in Truck Business, Experience (what companies employed by, how long and in what capacity), Availability (are you prepared to go anywhere or do you limit the distance?), Kind of Position Desired, and Remarks.

Upon receipt this information will be published in COMMERCIAL CAR JOURNAL. Unemployed fleet operators will also be accorded the privileges of this service.

-G. T. H.

Who Wants to be Tested?

An instrument which measures "reaction time of individuals" interested many engineers and fleet men. R. W. Brown, designer, found scores of willing subjects for test. The machine shows how long it takes a driver to lift his foot from an accelerator and apply the brake after a warning signal is flashed. Fleet men were interested, many of them were tested.

Our Own Ear-to-the-Ground Department

Balloons Soften Socks

Report of impact tests of trucks running on balloon tires over ordinary paved roads and city streets, soon to be released by the Bureau of Public Roads, will show that impacts are not sufficiently strong to destroy either roads or trucks.

How Much?

What does it cost to run an average truck a given distance? The long sought answer to this question is about to be given by a truck company. A chart, which involved thousands of calculations of data collected all over the country, will show cost per mile for trucks in various price classes operated a specified number of miles per day. Commercial Car Journal will have the pleasure of publishing the chart and the story of its compilation.

Highway Phrenologists?

Road supervisors may, within the near future, be able to ride over a road at 20 m.p.h. and, without stopping, leave behind them paint marks showing maintenance gang spots which should be repaired. The spots will be chosen not by the supervisor but by an instrument carried in the car.

R. W. Brown, chairman of the S.A.E. riding comfort sub-committee, believes there is need for such an instrument to measure road bumps and eject a gob of paint on the road at bad places. He also believes that such an instrument can be designed and built.

In Again

Don't be surprised if a manufacturer, whose name is now on a truck but who is not the manufacturer of that truck, comes out with a truck model of his own make. His aim, as we hear it, will be to produce specialized designs.

A Stopping Engine

Adapting engines for use as brakes appeals to several engineers. The Saurer truck engine, designed abroad some years ago, could be switched over to function like an air compressor. Required changes are not complex.

Sh-h-h, Maybe Alky
Sealed cooling systems employing other than water show promising results in tests. Engine efficiency is improved, radiator size reduced. Elimination of leaks is still a major problem.

Too Sociable

The "suction" at the rear of a large closed truck or trailer body effects passing automobiles, actually pulling them toward the body at the instant of passing, like the effect of a strong puff of wind. Several fleet managers are about to ask for budget allowances for streamlining one or more bodies for

An Airy Jolt

W. B. Stout, aircraft engineering vicepresident of the S.A.E. Jolted passenger
car engineers at the S.A.E. summer meeting with his comparisons of automobile
and airplane construction and weights,
and it is no secret that truck engineers
were present. Afterward several spoke
above whispers about springing truck
wheels independently to reduce unsprung
weight and using airplane fuselage construction in bodies and cabs.

STATE MOTOR VEHICLE SIZE

This Revised Compilation is Based on Interpretations of State Laws

STATE	NUMBER OF TRAILERS PERMITTED	LENGTH (R.)	WIDTH (L.)	HEIGHT (A.)	FOUR- WHEEL TRUCK GROSS	SIX- WHEEL TRUCK GROSS	TRACTOR & SEMI- TRAILER GROSS	TRUCK & 4-WH. TRAILER GROSS	TRACTOR SEMI-& 4-WHEEL TRAILER GROSS	TRACTOR 4-WH.SEMI- 4 6-WH. TRAILER GROSS	LOAD PER INCH TIRE WIDTH	LOAD	MINI- MUM AXLE SPACE (In.)	Must Trailors Have Brakes?
IA	134	33u 46c	96	12	24,000	32,000	32,000	82,000	32,000	32,000	n.r.	12,000	40(r)	B.S.
RIZ	13/2	33u 85e	96	141/2	22,000	84,000	34,000	44,000	56,000	68,000	700 (flanges)	18,000	P.A.	8.4.
RE.	3	33u 85e	96	141/2	22,000	30,000	30,000	44,000	52,000(1)	53,000(1)	(a) (2) (p) (3)	n.f.	96(f)	B.E.
AL	11/2	33u 60e	96 100 (p)	181/4	22,000	34,000	34,000	40,000	56,000	68,000	(a) 600 (base) 500 (metal)	17,000	40(r)	yes
OLO	11/2	33u 80-85c	96	121/2	30,000	40,000	40,000	60,000	70,000	80,000	800 (flanges)	20,000	40(r)	700
ONN.	13/6	40	102	2.0.	26,000(a) 32,000(p)	26,000(a) 40,000(p)	26,000(s) 40,000(p)	26,000(a) 40,000(p)	n.p.	n.p.	(a) 800 (channel) (p) n.r.	n.r.	D.A.	yes
EL	11/2	33u 60e	96	124	22,000(a) (4)26,000(p)	22,000(a) 38,000(p)	38,000(s) 40,000(p)	(8)	2.8.	n.a.	(a) 800 (channel) (p) 700 (casing)	16,000(a) 18,000(p)	D.A.	yes
PLA	1	35u 45e	84	12	8,000(a) (6)16,000(p)	8,000(s) (6)16,000(p)	8,000(a) (6)16,000(p)	11,000(a) 24,000(p)	11,000(a) 24,000(p)	11,000(a) 24,000(p)	(s) 600 (contact) (p) 600 (widestpoint)	(7)16,000	D.S.	yes
GA	B.F.	30u 85a	96	121/2	22,000	39,600(8)	39,600(8)	44,000	61,600	83,000	800 (flanges)	17,600	n.e.	B.A.
DAHO	11/2	23u	96	14	32,000	32,000	82,000	64,000	B.A.	n.s.	900	16,000	120(f)(9) 40(r)	B.6.
ш	n.r.	35a (10) 65c (11)	- 96	n.r.	24,000	40,000	40,000	56,000	72,000	72,000	800	16,000	40(r)	yes
IND	11/2	33u 40e	96	12	600(L+40) (g) (12)	Same	Same	Same	Same	Same	(s) 640 (flanges) (p) 800 (flanges)	12,800(a) 16,000(p)	B.A.	n.s.
IOWA.	. B.f.	30u 45e	96	12	450(L+5336)	Same	Same	Same	Same	Same		14,000(a) 16,000(p)	B.4.	8.6.
KAN	1	35u 50e	96	13	24,000(13) 28,000 on duals	34,000	46,500	56,000	n.p.	56,000	2.5	16,000 18,500 on duals	n.s.	2.6.
KY	. 1/2	261/2u 30e	96	111/4	18,000(14)	18,000(14)	18,000(14)	18,000(14)	18,000(14	18,000(14)			*****	2.4
Ц	11/2	33u 85e	96	14%	16,000 to 32,000(15)	38,400	64,000	64,000	96,000	102,400	900	8,000 to 16,000(15)	******	11.6.
ME	1	36u 62e	96	123/	A STATE OF THE PARTY OF T	30,000(a) 36,000(p)	30,000(s) 38,000(p)	36,000	n.p.	n.p.	(a) 700 (finnge) (p) 600 (fiange)	16,000(a) 18,000(p)	2.6.	24
MD,	n.r.		93	B.F.	MANAGEMENT AND DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN	40,000	40,000	50,000	65,000	80,000	(a) 650 (p) n.r.	3.4.	D.A.	80
MASS.	11/4	28u		n.a.	28,000(s) 30,000(p)	40,000(16	40,000	86,000(s) 60,000(p)	n.s.	n.s.	800	8.6.	B.4.	2.6
MICH.	2	35u 60s	N. CONTRACT	14	(17)	(17)	(17)	(17)	(17)	(17)	700	18,000 (17)	40(r) 108(f)	ы
MINN.	2	35c	Mariana and American	123	28,800(s) 36,000(p)	33,600(s) 42,000(p)	43,200(s) 54,000(p)	57,600(a) 72,000(p)	72,000(s) 90,000(p)	81,000(a) 102,000(p)	800 (base)	17,920(s) 22,400(p)	(18)	B.I
MISS.	24	300	96	12	(19)	(19)	(19)	(19)	(19)	(19)	400 to 800	8.6.	n.a.	n.
MO	1	331 40c		121	24,000 28,000(20	38,000 42,000(20	38,000	48,000	62,000	62,000	600 (flanges)	16,000 22,400(20	n.s.	2
MONT	r. 18/	OF STREET	AND DESCRIPTION OF THE PERSON NAMED IN	141	THE RESERVED AND THE PARTY NAMED IN	29,800	34,000	48,000	58,000	63,800	800	13,000 at 16,800(21	d 96(f)	n.
NEB.	11/		_	12	14,000 net load (22)						700	2.6.		. 2

REFERENCE TABLE

1—semi-trailer

n.s.-not specified

3—graduating scale from 314 in.— 1400 ib. to 10 in.—8000 ib 9—For 24,000 lb. and over 10—Tractor and semi-trailer restricted to same length as single unit 11—Starting 1932—40 ft.

12—20 per cent less on solids 13—80lids prohibited except for trucks hauling farm products 14—Effective January 1, 1933

^{2—}two trailers, either type c—combination of units

f - distance between first two axles
g - where weight is given by formula,
L is distance in feet between
front and last axles

distance between last two axles

s—solid stres t—distance between tractor axle and semi-trailer axle

^{1—10,000} lb. payload maximum on any full trailer regardless of number of axies 2—graduating scale from 2 in.—700

⁴⁻With power brakes on rear axies without, 36,000 lb.

^{5—}Full trailers are limited to 10,000 lb. 6—24,000 lb. if operated under cer-

^{7—}In counties specified by County Commissioners

^{18—}According to class of highway 16—On through routes 17—Load varies according to spacings, seasons and roads

AND WEIGHT RESTRICTIONS

By Competent Administrative Authorities of the Various States

STATE	NUMBER OF TRAILERS PERMITTED	LENGTH (A.)	WIDTH (in.)	HEIGHT (R.)	FOUR- WHEEL TRUCK GROSS	WHEEL	TRACTOR & SEMI- TRAILER GROSS	TRUCK & 4-WH. TRAILER GROSS	TRACTOR SEMI- & 4-WHEEL TRAILER GROSS	TRACTOR 4-WH.SEMI- & 6-WH. TRAILER GROSS	LOAD PER INCH TIRE WIDTH	LOAD	MINI- MUM AXLE SPACE (In.)	Must Trailers Have Brakes?
NEV	n.r.	B.F.	96	B.F.	25,000	38,000	38,000	50,000	63,000	76,000	600 (base)	-	42(r)	BA
к. н	n.r.	30u 85e	98	2.5.	20,000	20,000	20,000	40,000	40,000	40,000	750 (base)	15,000	B.G.	34
N. J	1	28u 56e	96	121/2	(19)	(19)	(19)	(19)	(19)	(19)	800 (base)	2,800 to 21,500(19)	2.0	-24
N. M	1	33u 85e	96	14	600(L+40)	Same	Same	Same	Same (23)	Same (23)	800 (rubber) 500 (metal)	18,000	40(r)	B.A.
N. Y	2	33u 85e	96(a) 106 (p)	13	28,800(s) 36,000(p)	35,200(a) 44,000(p) (24)	30,000(p) plus 24	30,000(p) plus (24)	30,000(p) plus (24)	30,000(p) plus (24)	(a) 640 (channel) (p) 800 (contact	17,920(s) 22,400(p)	46(r)	700
N. C	11/2	33u 55e	90	12	20,000	20,000	40,000	40,000	60,000	00,000	600 (contact)	n.r.	n.a.	700
N. DAK.	1	35u 70e	96	141/2	B.F.	B.F	m.r.	n.r.	n.r.	n.r.	na.	n.a.	n.a.	R.S.
оню	n,r.	35u 85e	90	121/2	20,000(a) 24,000(p)	20,000(a) 24,000(p)	38,000(a) 42,000(p)	40,000(s) 48,000(p)	56,000(a) 66,000(p)	56,000(a) 56,000(p)	650 (contact)	16,000(s) 18,000(p)	2.5	84
OKLA.,.	n.r.	35u 60e	90	n.r.	20,000(25)	20,000(25)	20,000(25)	40,000(25)	40,000(25)	40,000(25)	800	16,000(p)	n.e.	20
ORE	n.r.	34u 65e (26)	96	12	000(L+40) (g) (27)	Same	Same	Same	Same	Same	500 to 600	16,000(28) 17,000(29)	40(r)	yes
PENNA	11/2	33u 70e	96	141/6	26,000(30)	36,000	39,000	52,000	65,000	65,000	(a) 800 (channel) (p) 800 (contact)	18,000	36(r) 96(t)	yes
R. L	2	85e	102	121/2	28,000(a) 32,000(p)	40,000	40,000	56,000	68,000	80,000	800 (flange) 500 (metal)	22,400	24	3.6
s. c	n.r.	33u 50e	90	121/2	25,000 (31)	25,000	30,000	40,000	40,000	40,000	(a) 600 (contact) (p) 600 (flange)	10,000 to 15,000	n.s.	N.
S. DAK	. 1	50	96	121/2	20,000	20,000	40,000	40,000	n.p.	n.p.	600 (flange)	16,000	3.6	B.
TENN.	. B.E.	3.5	96	12	20,000	20,000	40,000	40,000	60,000	60,000	650 (contact)	n.r.	3.8.	100
TEX	. 1	35t	96	121/4	(33)	(33)	(33)	(33)	(33)	(33)	600	n.s.	n.e.	7
UTAH.	. 11/4			14	19,500(a) 28,000(p)	25,500(s) 34,000(p)	25,500(s) 34,000(p)	39,000(s) 52,000(p)	45,000(s) 60,000(p		(a) 600 (flange) (p) 800 (channel)	13,500(s) 18,000(p)	120(f) 40(r)	24
¥T	1	20.1		12	20,000(34) 16,000(35)	20,000(34) 16,000(35)	20,000(34) 16,000(35)	20,000(34) a.p.	n.p.	600 (contact)	n.s.	B.A.	
¥A	. 11/	30 85	u 96	124	The second second	35,000	35,000	40,000	40,000	40,000	650 (contact)	16,000	n.s.	7
WASH	1	35	u 96	n.r.	24,000	34,000	42,500	48,000	n.p.	n.p.	800	12,000 to 18,500	120(f) 144(t) 42(r)	у
W. VA.	n.	33 85	u 96	12	25,000(s) 32,000(p)	38,400(a) 48,000(p)	38,400(s) 48,000(p)	51,200(s) 64,000(p)	64,000(a 80,000(j	89,000(a) 112,000(p)		22,400(36 18,000(37 16,000(38	40	y
WIS	13	4 39	u 96	3.7.	15,000(39) 24,000(40)	22,500(39 24,000(40	36,000	48,000	60,000	72,000	800 (mfg. rating)	12,000(39 19,000(40)) R.A.	,
WYO.	n.	r. 40 88	ha 96	125	30,000	34,000	34,000	36,000	40,000	48,000	700 (flange)	18,000	168(f) 96(t) 90(r)	
D, of C	a.	r. 33	u 96	123	28,000(a) 30,800(p)	36,000(s) 39,600(p)	36,000(a) 39,600(p)	86,000(s) 61,600(p	64,000(72,000(a p) 79,200(s	(a) 800 (b) (c) 880	22,400(s) 24,640(p)	44(r) 144(f)	

load is 16,000 lb, or pneunatics and 12,800 lb. on solids f9—Capacity depends on tire size

21—In cities of 75,000 population or more 21—On six and four-wheel vehicles

spacing and intramunicipal

24—Gross weight limit for vehicle or combination having three or more axies on pneumatic, 30,000 lb. pius 750 lb. for each foot and major fraction thereof

of rear axie
25—Five permits provide different
capacities

26—Starting 1933 limit is 50 ft. 27—Solids may be used in municipalities only 28-Paved highways

39—Other highways 30—Gross weights limited by schedu

of chassis weights
31—Common carriers 17,000 lb. gros
on solids; 18,000 lb. on pneu
matics

33—Restrictions do not apply in the following counties: Shelby, Davidson, Laurence, Knoz, Sulitivan, Ramilton and Louden

lb. under certain conditions

15—In towns and incorporated muni

cipalities
36—Solids and pneumatics on major
highways in metropolitan area
37—Pneumatics on major industria

highways; solids 80 per cent 38—Pneumatics on major highway in industrial; solids 80 per cen

39—Class B highways

Trailers Ride Under Legislative Menace

CONTINUED FROM PAGE 19

factor in trailer application, in the opinion of an engineer on the staff of a factory making both trucks and trailers. He says: "Trailers require improved roads and fairly level country. * * * To triple the rated payload of a truck and expect it to develop satisfactory performance over unimproved highway is out of question."

Substantial savings resulting from use of trailers with trucks were pointed out by F. J. Scarr to the Transportation Club of Toronto recently, and in addition he demonstrated the effect of these savings upon the competitive position of motor hauling compared with rail freight. In a chart of comparative freight transportation costs in l.c.l. door-to-door service, he gave cost of hauling 100 miles by 5-ton truck at 46 cents per 100 lb.; 5-ton truck and trailer, 33 cents, and combination of tractor, semi-trailer and full trailer, 25 cents, the last figure being a reduction of practically 46% from truck cost.

Trailers are now operating in intercity service at speeds which have caused many operators to think about wind resistance. A semi-trailer body, pointed at both front and rear, was recently put in service between Newark, N. J., and Philadelphia, Pa. The unit is used to relay an average of 9 tons of pies from the Newark plant to the Philadelphia distributing station. The body, 20 ft. long, 7 ft. wide and 6 ft. high, has sides and top of aluminum and is 40 per cent lighter than a conventional body. Stanleigh Megargee, supervisor of automotive equipment of Pie Bakeries, Inc., designer of the body, states that it greatly reduces wind resistance without losing cargo space.

Moving Economies

Vans are not all of large capacity and much moving is now being done by semi-trailers pulled by tractors of the 1½-ton low price variety. In smaller cities where there may not be enough moving to keep a van busy every day, household furniture is being moved successfully in semi-trailers with rack body and tarpaulins. One commercial hauler tried this type of furniture moving as an experiment and reports that furniture arrives in better condition under tarpaulin than in regular vans and the saving in weight of body was considerable.

One of the striking developments of the past few years has been that of semi-trailers to carry loads well within capabilities of four-wheel trucks. With low-priced tractors available from the large production 1½-ton trucks, the semi-trailer advocates present a strong plea for carrying loads of from 3 to 5 tons. The first advantage they point out is that of reduced first cost, although reduction in price of trucks in the medium duty

classification makes this margin less than was the case a few years ago.

A. W. Kennerson, Standard Oil Co. of Ohio, put the saving at approximately \$1,000 per unit in February, 1930. (See article "Semi-trailers Cut Gas Trucking Costs" in COMMERCIAL CAR JOURNAL of that date.)

Author's Note:—Mr. Leo Huff, Pure Oil Co., during the discussion showed that in addition to the saving in initial investment, there is a saving in cost of replacing the semi-trailer and tank compared with a truck. He stated that the life of the rear end of a semi-trailer unit is from 10 to 15 years, and that he figures semi-trailer at 10 years and truck at 8 years.

Contributing to increased use of trailers with trucks is the advance in design and construction of trailer chassis and bodies. Trailer designers have been able to make trailer chassis lighter and stronger. They are prepared to furnish trailers with tires and wheels matching the tractor and in some cases they supply other units interchangeable with tractor units. Cooperation between trailer maker and body builder has simplified design and saved weight and cost as well as reduced operating expenses.

The mechanism which couples a semi-trailer to a tractor, commonly called the fifth wheel, has been, and still is, one of the most important factors in tractor development. Even in its simplest form, that between a tractor and semi-trailer which are not uncoupled in operation, it must submit to strains, impacts and contortions of a most complex nature.

Trailer operation is hampered by the fact that full automatic couplers and in fact plain couplers are not interchangeable. The need for interchangeability is obvious, and it has been discussed time after time. Demand of fleet operators for action looking toward standardization led to appointment of a sub-committee of the society to study the subject. The committee invited operators and trailer manufacturers to confer. Confer they did. The committee adjourned without finding a solution but the matter is not closed.

Makers of fifth wheels have reduced weight by carefully designing each part and by generally refining the design. At least two trailer manufacturers have introduced rubber insulation in the fifth wheel to reduce shock, noise and vibration.

In conclusion I wish to express appreciation for cooperation by owners, manufacturers, dealers and state officials in the preparation of this paper. Some of them are quoted directly, others, for various reasons, shall remain nameless.

The subject of "Use of Trailers With Trucks" is so broad that we might discuss it for a week without finishing. Perhaps enough has been said to show that the trailer is ready to carry its share of the problems of highway transportation and to accept the general responsibility of—a partner of the truck.

The President's Page

CONTINUED FROM PAGE 13

with such a load in high gear (with advertised standard tire size and gear ratio).

51 means the miles-per-hour speed on average level road (with advertised standard tire size and gear ratio).

When a vehicle leaves the plant with special tires and/or gear ratio, the "ability" will be rerated on the plate. If a dealer changes a stock job, he is instructed to do the same, and we have provided him with a simple slide rule truck gage which furnishes the necessary information accurately.

We think "Ability Rating" is the preventative against overselling, for which there seems to be more temptation this year than ever before. Even if the factory became tempted (but we won't be) to overstate the reasonable total gross rating, we would do so with the penalty of discounting the performance certified by the second and third figures.

And to be conservative these ratings are figured out, not at the peak or maximum, but at something less than full mechanical efficiency in order to allow leeway for an engine which is not maintained in the pink of condition. We think it will educate our salesmen to become better qualified to outfit the buyer according to his needs. It will enable them to recommend the proper vehicle, with the assurance that it will develop a performance as represented, consistent with sustained economy of operation and long vehicle life. If users seriously overload, they do so with their eyes wide open.

Where the same model is built for tractor service it will also be given a tractor "Ability Rating."

Judging from some capacity ratings we have noted in our study of the present situation, we would say that some trucks are abused even before they are delivered because they appear to be so optimistically or courageously rated.

Will Help Buyers

We have asked for no copyrights on "Ability Rating"; in fact, we welcome other manufacturers to join us in establishing a standard. This plan will enable users to select their equipment more comprehensively because "Ability Rating" takes the mystery out of truck performance. This newly adopted rating will be supplemented with intensive educational work among our salesmen. This should eliminate the possibility of overstatement to the buyer, for it will require them to present performance more intelligently.

Any plan that establishes a standard which will make it easier for truck buyers to select the proper type of equipment, merits the consideration of everybody interested in the truck industry. Consequently, we feel that our adoption of "Ability Rating" is a distinct step forward in better truck merchandising.

HAMMEDOITY OF AMOUNCARI LINE ACTES

THREE CLEVER TIME SAVERS FROM THREE REPAIR SHOPS

A COCHAR

Fig. I—Third Hand Wrench

Mechanics adjusting valve tappet clearance frequently wish that they had another hand, temporarily of course, to manage the wrench needed to prevent the tappet from turning while the tappet screw and lock nut are being adjusted. Charles H. Willey, Hoyt's Garage, Penacook, N. H., has devised a wrench which does the job.

"It is a special wrench made from two thin tappet nut wrenches having slotted short shanks attached to a slotted bar as shown. The wrenches are held in correct position by the two thumb nuts also shown." He adds that "It sure is a big help." We believe that many other maintenance men will agree.

Figs. 2 and 3—Carburetor Test Stand

The most interesting feature, perhaps, of a carburetor test stand built in the truck repair shop of the Warner Co., Philadelphia, is the special design of bracket for holding the carburetor during repairs. One of these brackets, shown in illustration 2, is bolted to a carburetor outlet flange when the overhauling is started. The bracket is then fastened in a vise and it supports the carburetor during disassembly and reassembly. When the job is finished the bracket is hung on a rail at the top of the test stand, supporting the carburetor during test. This saves bolting the carburetor in place for test and also provides a convenient method of holding the carburetor during work.

Brackets, which are uniform except for spacing of bolt hole lugs, are made of 1½-in. bar stock. A notch

MAINTENANCE ACES

- I. Third Hand Wrench
- 2. Carburetor Test Stand
- 3. Valve Spring Release

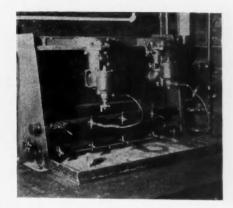
near one end engages a piece of ¼-in. pipe on the rail. Lugs are welded in place at right angles to bottom edge of the bar.

The stand measures 16 x 28 in. on the base. The end sections are 19 in. high, 9% in. wide at the bottom and 6 in. at top. One gasoline header supplies fuel under gravity pressure, the other under about 2 lb. air pressure, as found in some trucks in the fleet. Gasoline is carried in small detachable containers.

(Editor's Note:—Shop ideas of the Warner Co. fleet maintenance shop were described in the May, 1931, issue.)



2



3

Fig. 4-Valve Spring Release

Two fixtures used on a drill press save time on carbon and valve jobs of overhead valve engines in the GMT branch in Philadelphia. The first is a base on which the head is supported either side up. This is composed of two steel plates with machined edges held in parallel position on edge by spacers.

With the head upside down the valve gear studs and other projections are in the space between the plates. In this position on the table of the drill press the valve seats are reamed by power and the head is moved readily to position for each of the seats in turn

The other device depresses valve springs for removal of locks. It comprises a bar with a cross piece of tubing to which are attached eight smaller bars, spaced to bring them at the outer edges of valve spring keepers. The bar is fastened in the drill chuck and then the device is forced down over the valves by the feed handle of the machine. Valves are supported by blocks on a board placed on the base.



MOTOR FREIGHT TARIFFS ARE BASIS OF STABILITY

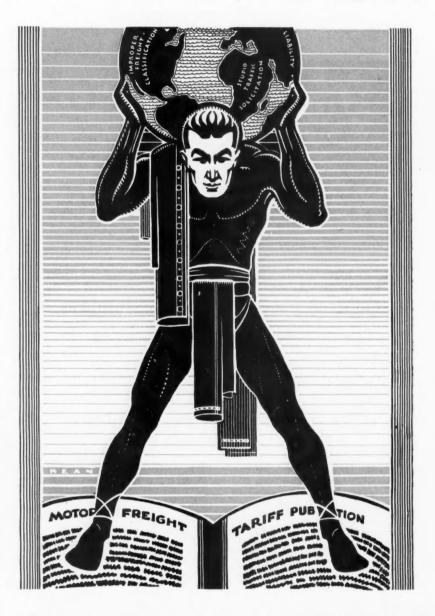
Accurate Publication, Fulfilling Legal Needs, Is Necessary to Win Confidence

> This is the Sixth Instalment of a series on Common Carrier Problems

BY G. LLOYD WILSON

REIGHT tariffs are to motor freight carriers what price catalogs are to manufacturing companies, and more. They are the official binding publications which are usually required to be filed with the state public service commissions or other regulatory or administrative bodies having jurisdiction over motor transportation. These publications serve not only to give rate and service information to those who use or seek to use the facilities of the motor carriers, but they bind the carriers to transport the goods offered at the rates named in the carriers' tariffs. The motor freight lines which have tariffs on file with the state regulatory or administrative bodies cannot depart from the rates and charges named in the tariffs without having such action punished by fines or the cancellation of their certificates of public convenience, if they are convicted of this violation of the law by the appropri-ate state tribunal. Other transporta-tion utilities including, usually, railroads, electric railways, railway express companies, steamship and steamboat lines, and many other types of carriers are required by the state laws to publish and file tariffs naming the rates and charges applicable over their lines in intrastate commerce, while many interstate carriers which are enumerated in the Interstate Commerce Act must publish, post and file their tariffs of rates and charges with the Interstate Commerce Commission.

Since freight tariffs are matters of state regulatory requirement, the provisions of a typical state law may well be used as a basis for discussion. Several states gave consideration to the publication of motor freight tariffs just prior to the World War, and from that time on one state after another has taken jurisdiction over motor

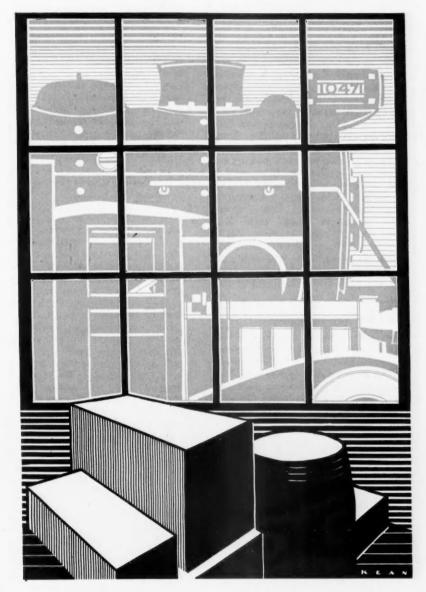


freight carriers and has prescribed tariff regulations to govern the motor carriers. Orders are issued by the state regulatory bodies instructing the motor freight carriers to publish and post their tariffs and to file copies with the state commissions. Tariff publishing regulations are also issued by the commissions instructing the carriers in the procedure to be followed in compiling, publishing, posting and filing their tariffs. Despite the efforts of the commissions and the cooperation of many of the motor freight carriers, the results were far from satisfactory.

Mr. Lewis A. Monroe, a classification and tariff expert, who is now the publishing agent of the "Monroe 'Ship-By-Truck' Freight Classification which is extensively used by California motor freight operators, and who for some years was employed by the Railroad Commission of the State of California, in commenting upon the early results of the California Commission's first tariff order, states:

"Shortly ofter the passage of the regulatory law in 1917 an order was issued by the Railroad Commission requiring motor carriers (operating between fixed terminals and over regular routes) to file their tariffs showing the rates that were being assessed. This order resulted in the filing of some 350 different freight Turn to page 36, please

Rails and Express Trucks Join in Pick-up Delivery



TORM clouds, rolled up by the railroads, gathered over truckmen's heads on June 25 when the Pennsylvania Railroad and the Reading System announced an l.c.l. collection and delivery service between Philadelphia and Camden on one end and Atlantic City and Ocean City, N. J., on the other end. A bolt of lightning was concealed in the clouds. Public announcements, which were not concerned with the effects of the service on truckmen, referred to this bolt as the Railway Express Agency, which, it was revealed, will do the trucking—both pick-up and delivery—for the railroads. This marks the first time that the Railway Express Agency trucks have been used in such a service. It

establishes a precedent which may produce national consequences.

The flat rate for the service from Philadelphia and Camden to Atlantic City is 28 cents per 100 lb., and to Ocean City, 29 cents per 100 lb. The same rates prevail in the reverse direction. There is a minimum charge of 50 cents for a single shipment from one consignor to one consignee on one bill of lading.

These complete-service rates are much lower than the rates charged formerly for the exclusive rail haul. For example, a shipment of candy from Philadelphia to Atlantic City cost 45 cents a hundred. To this had to be added the drayage cost of picking up and of delivery. Now the candy is

Pennsy, Reading and Railway Express Collaborate to Regain I.c.I. Business

BY GEORGE T. HOOK

picked up at the consignor's establishment in Philadelphia and delivered right to the consignee in Atlantic City for 28 cents per hundred. On fresh meats the straight rail rate from Philadelphia to Atlantic City was 53 cents a hundred. Under the new tariff it is 28 cents.

These examples are sufficient proof that to truckmen doing a drayage business in the areas involved, the clouds look particularly dark.

Over-the-road haulers, plying trucks between Philadelphia and shore points, maintain that they are not alarmed. To support this claim they point to the fact that over-the-road rates between Philadelphia and Atlantic City have for some time averaged around 25 cents a hundred. However, one truck operator declared the chances of losing business to the railroads have been increased because the slight difference of 3 or 4 cents a hundred may cause the shipper to incline toward the railroad as the more responsible transportation agency. When the difference in rates was much greater, this operator argued, the shipper could afford to take a chance on responsibility in the event of loss or damage. Not so today. The slight difference in rates simply places a premium on responsibility.

The unfavorable effect on consolidators of less-carload freight is obvious. The minimum boxcar rate is something like 18 cents a hundred. Add to this trucking and handling charges at the shipping and receiving ends, and there's no possible way that consolidators can meet the flat rates of 28 and 29 cents for the complete collection-shipment-delivery service, and make a profit.

As a matter of fact, there is much speculation among truckmen regarding the profitableness of the cooperative railroad and Railway Express Agency arrangement. According to reports from authoritative sources, the railroads asked a number of large

trucking concerns in the terminal areas concerned to bid for the collection and delivery business of the new set-up. Just how sincere they were in making this request, only the railroads know, but several operators contend it was a mere formality. The railroads must have known beforehand what the Railway Express Agency would do the hauling for, and likewise must have known that an unsubsidized trucking concern could not possibly undercut the agency. If unconfirmed rumors of the rate at which the Railway Express Agency is doing the trucking have anything of truth in them, then the railroads asked for bids merely as a matter of form. These rumors vary but slightly. The lowest rate they speak of is 6 cents a hundred, and the highest 8 cents a hundred. Even the high of 8 cents is admitted to be a rate which no independent trucker could possibly meet. One large operator in Philadelphia said that, according to his own records, the actual average cost of collection and trucking to railhead is 10 cents a hundred.

Figured on this basis, it is not strange that truckmen are puzzled by the new railroad tariff. No matter how much they scratch their heads they cannot find a satisfactory answer to the question that will always remain a puzzle: Why should railroads be so anxious to get back less-thancarload business when, they have admitted themselves, it is not profitable business to handle. If it was unprofitable to handle when rates were high, what will it be with the lower rates?

Experiment?

Of course the Philadelphia-seashore combination is an experiment in the same sense as the store-door service announced last October by the Southwestern Lines. The difference is that in the eastern experiment the railroads contracted with the Railway Express Agency (railway owned) to do the trucking, and in the southwestern experiment contracts were made with local drayage companies. (Refer to October, 1931, and January, 1932, COMMERCIAL CAR JOURNAL.) In both cases success will be measured by the amount of tonnage which has been returned to the railroads.

In the event the cooperative railway express and railroad service proves encouraging there is reason to credit the general impression that extension of a similar store-door service to other cities is but a matter of course. A transportation expert declared to the writer that the Railway Express Agency already has formulated plans covering every large city in the country. And since the railroads are crying for more tonnage, and since their subsidiary, the Railway Express Agency, is also crying for tonnage, extension of the service appears inevitable. But before this happens the railroads must determine cost figures and public acceptance. Railroad men are by no means sold on store-door service. "It's no good, but let's try it," just about summarizes their feelings.

The following, briefly, are some of the rules governing the tariff applying to the Philadelphia-seashore service: (These are taken from the tariff published by the Pennsylvania Railroad.)

 Patrons wishing collection and/or delivery service should notify the railroad's agent at origin of their desires and indorse the bill of lading cover-

ing each shipment.

2. This company will arrange for collection and/or delivery of the freight at customer's doorway or platform, and only if such location is readily accessible to trucks, and conditions of streets or alleys leading thereto or therefrom permit practicable truck operation. (This is one of the rules of the tariff applying to the Southwestern store-door service, but in actual practice draymen are making collections and deliveries from and to upper-story shipping rooms.)

3. Articles which are not accepted are: Shipments which owner is required to load or unload under Rule 27 of Official Classification; pieces or packages which exceed 14 ft. in length, 6 ft. in width or 6 ft. in height; explosives, acids, corrosive liquids and other prohibited articles; empty con-

A Shudder for Truckmen

The railroad-owned Railway Express Agency gave truckmen something more to worry about when it recently filed tariffs with the Public Service Commission of Pennsylvania governing the hauling of motor freight having no connection with a rail haul. Truckmen, through their attorney, Harold S. Shertz, of Philadelphia, are protesting. In the first hearing the Agency sought to prove that in the past it has done a motor freight business not necessarily connected with a rail haul, and that on this account the certificate under which it operates for rail hauls is sufficient to cover the exclusive trucking service.

Other hearings will be held. The truckmen will contend that a favorable decision would give the Railway Express Agency a state-wide certificate virtually without restrictions and hence broader than that of any other hauler in Pennsylvania. Consequently it would enable the Agency to enter actively into the local trucking field, with effects which local truckmen cannot contemplate with-

out a shudder.

tainers; live animals; bulk freight; chinaware, earthenware, porcelain ware or stoneware; clocks, watches; fertilizer and fertilizer material; live game; undried hides and skins; animal hoofs and horns; household goods; jewelers' sweepings; paintings or pictures; live poultry and pigeons; rugs; silk, raw, spun, schappe or thrown (including organzine, singles, tram, warp or yarns; bank bills, coin or currency; deeds, drafts, notes or valuable pa-

pers of any kind; jewelry, postage stamps or articles with postage stamps affixed; precious metals or articles manufactured therefrom; precious stones; revenue stamps, or other articles of extraordinary value.

4. C.O.D. shipments will not be accepted unless authorized by this company. Collections will be made in cash only, unless otherwise specified by shipper on bill of lading. The charges will be 25 cents on amounts of \$100 or less, and on amounts over \$100, 10 cents for each additional \$100 or fraction thereof collected.

5. Where delivery service is performed, no arrival notice will be given. If shipment is not accepted when offered, consignee or owner must arrange for removal from railroad premises at his expense. Such shipments will be subject to uniform storage charges.

S.A.E. Groups Consider Problems of Industries

CONTINUED FROM PAGE 23

White Sulphur Springs, of which M. L. Pulcher, Federal, was chairman. Mr. S. Johnson, Jr., of Bendix-Westinghouse Auto Air Brake Co., described air types of brakes, and R. P. Breese, Bragg-Kliesrath Corp., spoke of the vacuum type. Both the papers and discussions revealed that lag in actual application of brakes, that is the time which intervenes between pressing of the pedal by the driver and actual contact of brake shoes with brake drums, has been greatly reduced. Mr. Breese quoted a figure of 1.5 ft. of travel at 20 m.p.h. The need for brakes on trailers because of operating conditions, as well as registration, was stressed and both speakers explained how power brakes had been applied to trailers.

Air Preferred

The question of the logical field of application of vacuum brakes and of air brakes arose during the discussion and it inspired comment by both manufacturers and fleet owners. Mr. A. J. Scaife, White, remarked that air pressure seemingly was preferred on trucks rated from 2½ ton upward.

Power brakes provide very high deceleration for heavy duty vehicles, so high in fact that Mr. Breese cautioned operators that it will "be necessary to load their trucks and trailers very much more carefully; in fact, the loads will have to be clamped down."

An instrument which measures the smoothness of finish of cylinder walls was described by H. M. Cramberry, Perfect Circle Co., in his article "Piston Ring Progress." The instrument which is mounted on top of a cylinder supports a graphite pencil lead in position so that it can be moved up and down in the cylinder bore like a piston. A dial on top of the instrument measures wear of the lead which is, of course, in proportion to smoothness of the cylinder wall.

TAILVE DOLLY CIL

Motor Freight Tariffs Are Basis of Stability

CONTINUED FROM PAGE 34

tariffs applying between various sections of the state. And when I say 350 different tariffs, that is exactly what I mean, for it was found that no two tariffs were alike and all were vague and indefinite." Mr. Monroe's testimony on this subject confirms the observations of many others, the the present writer included, upon this point. In the years or so following the first experiments with motor freight tariffs, the commissions, the carriers and tariff experts have wrestled with the problem of tariff construction to attempt to bring some degree of uniformity and order out of motor freight tariff chaos.

Motor freight carriers in different parts of the United States issue from time to time a considerable amount of printed matter calling attention to their services and soliciting traffic. These publications take various forms -cards, blotters, pads, posters, letter sheets, rate tabulations showing typical rates, and other various forms.

These are not tariffs.

They have no standing under the law and shippers may not rely upon the rates shown in such publications as official information with respect to the rates or charges of the carriers.

A freight tariff to be a bona fide freight tariff must be prepared in the form prescribed by the state law. In most cases the tariff must contain:

Title page indicating the nature and scope of the tariff.
Set of rules and regulations governing the tariff.

n

y

f

of

of

n

h

r.

ir

n

rh

S.

u-

Srs

he

he

lls

nt

er in

up

à

u-

ch

h

the tariff.

Description
classes of ar iption of the commodities or of articles for which rates are ranged.

Table of rates or other means of compiling rate data.

A typical tariff which conforms fully to the tariff regulations of the public utility commission of the state in which it is effective shows upon its title page the following pertinent information:

Carrier's own tariff number. Number of the tariff of the carr ed with the state public utility mission

mission.

Number of supplements of the tariff that are permitted by the state law to be in effect at any one time.

Name of the carrier issuing the tariff. Type of the tariff-whether class rate or commodity rate, or both.

Points between which or the territory within which the tariff applies.

Freight classification which governs the tariff.

Date of issue and the effective date of

Name and address of the officer or agent of the carrier issuing the tariff.

The rules and regulations governing the transportation of goods published by motor freight carriers in their tariffs constitute the code governing the services offered by the carriers, the use of the services by shippers and consignees, and the application of regular rates and special charges to the services. There are no standard motor carrier rules and regulations, although many individual motor freight lines and motor freight tariff publishing agents have drawn up rules and regulations for their own

individual lines or the groups of motor freight carriers. Some of these rules are voluminous and complicated; others are brief and simple. Many codes of rules and regulations are so complete that some of the rules are mere ornaments, while others are so incomplete that there are important omissions.

It is not desirable in a general discussion of motor freight tariffs to present one or several codes of rules and regulations with the recommendation that a certain code be adopted in toto by the motor freight transportation industry, or by any group of motor freight carriers, or even by any single carriers. Rules and regulations, in the absence of legislation requiring the adoption of any uniform set of rules and regulations, should be drafted by motor carriers to fit the needs of the carriers and the public they serve. Uniformity is desirable and it would be a great step forward if the motor freight carriers would appoint a committee of tariff experts to draw up a uniform code of rules and regulations, and they have this uniform code adopted by every motor freight carrier in the United States. Until that time comes the motor carriers' freight tariffs should contain clear and explicit rules and regulations stating fully but without under verbosity the policy of the carriers upon each of the following points:

The classification that governs the transportation of freight over the line of

the carrier.

The government of all transportation services, rates and privileges by the tariffs lawfully on file with the state regulatory

The government of all transportation services, rates and privileges by the tariffs lawfully on file with the state regulatory commission.

The general application of the state law and the administrative regulations of the state regulatory commission to all transportation services rendered by the carrier. The assessment of charges upon light but bulky articles upon the basis of the space occupied rather than weight, fixing the number of cubic feet of displacement to be considered as the equivalent of 100 lb. or 1 ton, as the case may be.

The right of the motor freight carrier to refuse to transport freight which it is unable to transport because of excessive size or weight, unwieldy shape, insecurity of packing, excessive fragility, or other similar reasonable restriction.

The right of the carrier to assess extra charges for pick-up or delivery services which require excessive labor or time to perform or which necessitate unreasonable delay to vehicles or other equipment.

The right of the carrier to refuse to accept for transportation goods which are dangerous, inflammable or explosive, or which the carrier is forbidden by law to transport, or which are apt to impregnate, destroy or injure other freight on the vehicles or other property of the carrier. The carrier may reserve the right to accept such freight for transportation subject to delay for suitable equipment.

The application of rates to or from points not mentioned in the tariffs but which are intermediate or adjacent to points named.

The rules governing the payment or prepayment or guarantee of transportation charges to the carrier by the carrier upon the goods to insure the payment or charges and the right to sell the goods to discharge the debt.

The retention to lien by the carrier upon the goods to insure the payment of charges and the right to sell the goods to discharge the debt.

The retention of lien by the carrier of the goods.

The reposition for the insurance of the provision for the insurance of the carrier of the goods.

wise.

The right of the carrier to refuse articles of extraordinary value.

The provision for the insurance of goods at the expense of the owner beyond

the limits of liability assumed by the car-rier under the law and the provisions of its tariff.

rier under the law and the provisions of the rules governing the advancing of charges to connecting carriers or others. The regulations governing the routing of shipments, either over the routes of the carrier or over connecting lines.

The rules governing the handling of refused or unclaimed shipments.

The regulations governing the storage of freight by the carrier.

The basis of rates and rules governing the transportation of returned empty containers.

tainers.

The provisions for truck-load minimum weights and the application truck-load and less-than-truck-load rates.

The basis of rates and transportation regulations governing shipments in excess of truck-load lots.

The regulations governing the use of shipping documents.

The marking of the freight, including not only the ordinary identification marks, but special markings for fragile goods.

Minimum charges.

Minimum charges.

Minimum charges.
Split delivery regulations governing the delivery of goods from one shipper to several consignees or destinations.
The regulations governing the assumption of liability for loss or damage to other freight or the property of the carrier by shippers who forward dangerous freight without proper markings or without disclosing to the carrier the nature of the freight.

out disclosing to the carrier the nature of the freight.

The time limit within which claims for loss or damage must be filed with the carrier.

The basis for the computation of freight

charge

Insurance against marine risks if the goods are transported partly over water Special pick-up or delivery services and

rates.
Rules governing departure from regular routes of the carrier.
The use of estimated or agreed weights in lieu of actual carriers and the shipper.

Several different plans are followed by motor carriers in issuing their freight tariffs. In some cases the traffic managers of individual motor freight carriers compile and publish their own individual freight tariffs applicable over their lines. These tariffs may be classified as "local freight tariffs." Literally thousands of such tariffs are issued by motor freight carriers in the United States. These tariffs vary greatly, in form and completeness, ranging from simple and often inadequate single-sheet tariffs, to complete and often complex publications containing many pages.

Other motor carriers join with others and publish joint tariffs naming rates and providing rules and regulations governing the transportation of freight over their own lines and over connecting lines. These tariffs bear the names of the several carriers issuing them, and they are usually issued by the traffic officer of each of the carriers as a joint publication. Tariffs of this type are less common than local tariffs, due to the increasing number of joint through motor freight routes.

A third type of motor freight tariff is the "agency" tariff. Tariffs of this type are issued by tariff experts who retained by groups of motor freight carriers to publish local and joint rates applicable over the routes of all of the carriers who participate in the tariff and concur in the rates and routes published. A tariff of this type is published by R. H. Culbertson, as agent for the Washington Motor Freight Association, at Tacoma, Washington. This association embraces nearly 100 leading motor TURN TO PAGE 44, PLEASE

LYCOMING - MACK SIXES



Mack BQ carries g.v.w. rating of 27,000 lb.

Mack Puts 3 Sixes in Medium Range

ACK TRUCKS, Inc., is now actively engaged in the production of three new six-cylinder trucks, designated as Models BM, BX, and BQ, in the medium capacity range. The three units have a close resemblance to each other in exterior design. All are characterized by a set-back front axle, door type hood ventilators, coupe type cabs and deep radiators.

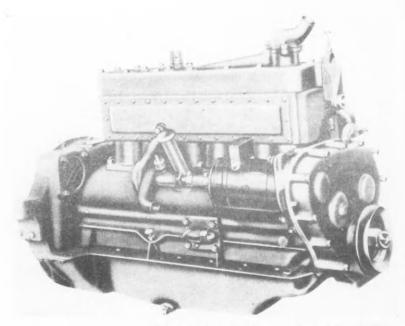
Although the smallest of the new models BM is rated as the largest medium capacity highway freighter in the Mack line. It is powered by a 4 x 5½ in. engine developing 93 hp. at 2250 r.p.m. It is offered with dual reduction drive only, either as a truck or tractor, wheelbases for the former being 157, 181, 199 and 217 in.; 138 in. for the latter.

Available in either dual reduction or chain drive, Model BX has a g.v.w. rating of 23,600 lb. This model with its 4½ x 5½ in. engine developing 104 hp. at 2300 r.p.m. is built in five wheelbases: tractor, 136 in.; dump, 160 in. and 178, 196 and 214 in. for transport highway service.

Model BQ, carrying a g.v.w. rating of 27,000 lb., is built with a dual reduction rear only. It is powered by a 4% x 5% in. engine developing 104 hp. at 2050 r.p.m. This model is also offered in five wheelbases: tractor, 156 in.; truck: 191, 209, 227, and 245 in. Clutches are of the dry, single-plate type mounted with four-speed transmissions in unit with the engines except in Model BQ where an amid-ships type of transmission is employed. The BX transmission has a low first-gear ratio of 7.04:1. Under or over-drive auxiliaries directly attachable to the transmission are available in this model

Rear axle shafts are full-floating. The BX chain drive rear axle is tubular with final drive by side chains, running over case hardened sprockets. Five rear axle ratios on the BM and Lycoming Gets Rigidity in Two New S Engines

YCOMING has added two new six-cylinder truck engines to its line: Model SA, having a 3¼-in. bore, and SB, 3%-in. Stroke of both engines is 4½ in. Displacement of Model SA is 224 cu. in. and the horsepower rating is 61 at 2800 r.p.m. with maximum torque of 145 lb. ft. at 1000 r.p.m. Model SB displaces 242 cu. in. and develops 65 hp. at 2800 r.p.m. with



Lycoming S Models have common stroke of 41/2 in.

BX Models, from 6.54 to 8.92 provide a range of road speeds from 29.2 to 41.1 m.p.h. on the BM and 30.4 to 41.5 m.p.h. on the BX. Ratios on the BQ are from 6.52 to 10.44, providing a road speed of from 24.1 to 38.4 m.p.h.

A feature of these three models is a group chassis lubrication system, in which grease is run through tubing from a central point on either side of the frame to all points easily and quickly.

Frames of all three models are heattreated pressed steel, tapered toward front and rear and rigidly braced by both tubular and channel cross-members. Maximum depth of the BM frame is 7\%16 with a thickness of \%32 in.; the BX is 9\%2 x \%4 in.; the BQ 10\%2 x \%4 in.

Service braking is through mechanically operated four-wheel brake system. Shoes actuated by vacuum booster expand in nickel-alloy cast-iron drums of the enclosed type. The hand brake is located on the propeller shaft except in the chain driven BX, where the jackshaft mounting is employed.

maximum torque of 160 lb. ft. at 800 r.p.m. The compression ratio of the smaller engine is 4.87:1; the larger, 5:1. Three-point mounting is employed, the front support being of Lycoming special design recessed for rubber pad.

Cylinder block and head are detachable. The block is of chromium iron and the crankcase is given ruggedness and rigidity by longitudinal ribs running full length of the case and cast a little above the flange.

Intake valves are of chrome nickel with port diameter of 1 7/16 in. and valve seat angle of 30 deg. Exhaust valves are of silchrome steel with port diameter of 1 5/16 in. and valve seat angle of 45 deg. Valve lift is 5/16 in.

Lubrication is by pressure through passages drilled in crankcase and rotating parts. The oil pump, gear type, is driven from camshaft by spiral gears. Camshaft and accessory drive is through gears. Intake manifold is of downdraft type and Swan design with updraft manifold as optional equipment.

WHITE - FEDERAL - G.M.T.

White 691 Tractor Meets 40-ft. Road Restriction

HITE'S new Model 691 short wheelbase tractor, intended for heavy duty transport hauling, has been especially designed to meet the new 40-ft. maximum length allowance in certain states and makes possible the use in general operation of longer trailers and bodies without increasing the overall combination vehicle length. Wheelbase is 129½ in. and maximum gross weight rating, 32,000 lb.

The engine is the White 5-AD, a 4% x 5% in. six-cylinder of the overhead valve type with a displacement of 580 cu. in. It has a seven-bearing counter-weighted crankshaft, special aluminum alloy pistons and pressure and metered lubrication to every moving part. Exhaust valve seats are of the inserted type developed by the The White Co. An air compressor is mounted in front of engine and driven directly through a splined connection from end of crankshaft.

The transmission is a White five-speed unit with a silent overdrive of .715: L mounted in unit with a single plate oil type clutch. The front axle has been specially designed with a wide tread for short turning radius. The rear axle is of the full floating double reduction type furnished in 8.36, 10.15 and 11.85 ratios. Heavy duty radius rods are used. Service brakes are of the four-wheel internal type, air operated, and the parking brake is disk type mounted on the end of the transmission. The frame, 8½ x 3¾ x % in., is pressed steel.

00

he

er.

m-

y-

or

ch-

on

ed-

ibs

nd

kel

ind

ust

eat in.

ıgh

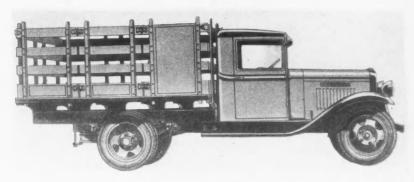
rope, iral

rive

d is

ign

nal



Model T-32, G. M. T. lowest priced 2-3 ton truck

rating of 28,000 lb. Like other Federal single-drive six-wheels, the driving axle of Model T10SW, the new unit's designation, is placed at the rear with the dead axle ahead. Power is provided by an 80-hp., 4 x 4½-in. six-cylinder engine.

It is built in three wheelbases: 188, 206 and 224 in., listing at \$3,895, \$3,945 and \$4,045, respectively. Ventilated disk wheels fitted with 34 x 17-in. tires, dual on all four rear wheels, are standard.

Six-wheel hydraulic brakes amplified by vacuum booster are provided. Drums are 16 x 2¼ in. front and 17½ x 4 in. rear. All spring pins connected with the rear axles of this unit and all trunnion pins are mounted on Federal Reservoil bearings, which are automatically lubricated. Flexibility of the rear end is obtained by the use of swivel brackets for connecting the rear springs with the rear driving axle.

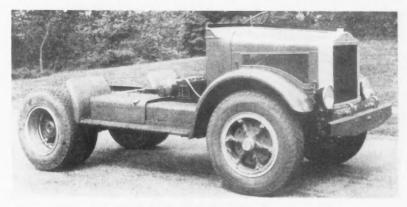
New G.M.T. 2 to 3 Ton Lists at \$745

NCREASING its line to meet the expanding requirements of the truck field, General Motors Co. announces a new 2 to 3-ton truck powered with a 66-hp., 6-cylinder engine and priced at \$745 for the 131-in. wheelbase, and \$790 for the 157-in. wheelbase chassis. The new truck, known as Model T-32 and straight rated at 10,000 lb., takes its place as the lowest-priced commercial vehicle in its range ever offered by G.M.T. Featuring a full-floating rear axle with dual rear tires and auxiliary rear springs, the new truck is offered with ten different body types covering a wide field of use. When used as a tractor this model may be coupled with the recently announced TT-218 semi-trailer.

The powerplant is a 3 5/16 x 3%-in. Model 200 developing 66 hp. at 3200 r.p.m., mounted in unit with a G.M.T. plate clutch and four-speed transmission.

The long semi-elliptic springs are correctly proportioned to provide proper capacity with easy riding. The front springs are fitted with snubber leaves and self-adjusting shackles. The rear springs are of the two-stage type, the auxiliary springs, 29 x 2½ in., being mounted above the main springs in separate stop brackets.

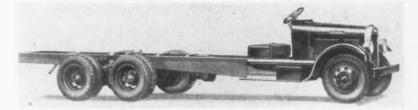
Wheels are of drop forged Spoksteel 5-stud type with dual wheels as standard equipment. Heavy duty 6.50/20 tires are used on all wheels with other optional tire sizes available at additional cost.



New White equipped with 10.50/24 balloon tires

Federal 8-Ton Six - Wheelers

N 8-tonner is the latest six-wheel product of the Federal Motor Truck Co. The development of this model is the result of success of Federal 3-ton and the 4 to 5-ton, 6-wheel models. The new unit carries a gross weight



Federal's 8-tonner is built in three wheelbases

When Should a Piece of Equipment Be Retired?

CONTINUED FROM PAGE 25

ating costs charted. At this point we also give thought to rearrangement of work to types of vehicles so that we can keep pace with changing conditions. This requires consideration of the type of work they are doing at present, type of vehicle they are, and type of work they are likely to perform during the next year.

The chart shows the make and type of the vehicle to be retired, its average operating cost for the past year, the average number of miles traveled per year, or month, and on the same line, under other columns, we show the type of new vehicle considered for replacement, its expected operating cost per mile (which can be quite accurately determined from cost records) and the expected average saving per year of operation of the new vehicle over the old vehicle. Below appears a sample of this chart:

Retire Cost Pearly Mileage Cost 1½XYZ 0.0934 14,000 \$1,307.60

Where you are purchasing a replacement vehicle which you have never before had in your fleet, your expected operating cost will either have to depend on performances of that kind of vehicle in other fleets, or you will have to guess at it.

It is very seldom in making up these charts for our budget that we do not show a very substantial saving to be made in the first year's operation of the replacement vehicle, the saving sometimes amounting to from 20 to 50 per cent of the initial cost of the replacement vehicle.

For instance, from our last year's chart, I find that a certain piece of light (pick-up) equipment was costing 0.068 cents per mile, including all fixed charges. We intended to replace with like equipment, which our records showed would cost us 0.051 cents per mile for the first year, and the vehicle traveled 12,000 miles per year average. The saving of 0.017 cents per mile on 12,000 miles for the first year amounted to \$204. The initial capital investment of this type of vehicle was about \$600. There's a 33 1/3 per cent return on the investment the first vear. And don't think that that's all just bookkeeping hooey, either. It is not. And that did not include the increase of over 0.068 cents per mile which the old vehicle would have cost us had we retained it for that year. And, in addition to that, our trade-in value would have suffered a severe jolt.

A heavy duty vehicle slated for the grave on this same budget was costing us 0.219 cents, including the works. Our intended replacement figured to stand us 0.160 cents per mile on 10,800 miles for the first year. This saving of 0.059 cents per mile for the

first year worked out at \$637.20, which was about 20 per cent of the initial capital investment. And added to this, of course, was the increased trade-in value over what we would have received had we retained the truck another year.

The highways are full of rattling truck equipment, owners of which are patting themselves on the back because their trucks are seven, eight or nine years old and still running. This is heavy stuff, of course. But those operators should be kicking their own pants. There is a very noticeable trend lately to retire the heavy duty trucks at from 60,000 to 80,000 miles. My personal opinion is that no truck, regardless of mileage, should be operated longer than five years.

On the other hand, we find fleets where trucks will run from 2000 to 6000 miles a month (and some more than that). Such operations will bring trucks down to a low time basis where a mileage limitation of 60,000 to 80,000 miles is imposed. Under a mileage basis you would be retiring

 Replace With
 Expected C.P.M.
 Cost
 Saving

 1½T PDQ
 0.060
 \$840
 \$467.60

at one year of age, which does not necessarily give your truck time to become obsolete. In these cases trucks should be considered carefully, the work should be surveyed with the idea of extending its useful life to 100,000 miles, mechanical condition permitting. Good mileage is being built into trucks if properly handled, but it does not appear economical to go beyond 100,000 miles. The entire matter, of course, rests with the operator.

Obsolescence is one of the great drawbacks to keeping trucks over a long period of years. In these days of rapid change, trucks become obsolete in at least two years. New devices come out, changes in ratings occur, tire equipment is improved, motors improved, chassis improved. A man keeping vehicles in operation for

too long a period loses the advantages of a lot of good new stuff that makes its bow every year.

The charting of costs as they increase from year to year, or for every 10,000 miles traveled, are important to the proper operation of the replacement program. It so happens that our passenger and light groups average 13,000 miles per year per vehicle, while truck units, %4-ton and over, average 9000 miles per year per vehicle.

By way of example, let me put down a few figures to show how the cost of operation increases per 10,000 miles. These figures would, of course, vary with the average age of the groups. In the following groups, the first two have an average age of about 40 months, or 43,200 miles of travel per vehicle, while the last four groups have an average age of about 60 months, or 45,000 miles of travel.

By way of example, let me put down a few figures to show how the cost of operation increases per 10,000-mile periods. These are group averages, and the costs shown include gasoline, oil, tires and tubes, repair labor and material, painting labor and material, and garage overhead expense:

Operation Cost Per Mile

Group Class	Miles	20,000 Miles	30,000 Miles	40,000 Miles
Light pass. cars.		0.030	0.035	0.042
1½-2-ton trucks.		0.052	0.053	0.062
2½-3½-ton trucks	0.050	0.059	0.065	0.089

It doesn't require more than one eye to see that at 40,000 miles the cost per mile is about double the cost for the first 10,000 miles, and of course it follows that beyond the 40,000-mile mark the cost rises still more sharply. These figures argue a comparatively short life, though it must be remembered that certain types of vehicles performing certain classes of work can be expected to give a considerably longer economical life than these averages would indicate. This,

TURN TO PAGE 44, PLEASE

Improvement Requisition Based on Estimated Operating Costs

DOE, DOE & DOE CO.

TRUCKERS	
IMPROVEMENT REQUISITION: RETIRE: 1 3-ton Great Six, six-wheel truck, used for dai Miles traveled to date Age in months Average miles traveled per month Operating cost per mile, present Condition: Needs new rubber all around, needs general mot transmission and rear-end overhaul, paint job, body and pockets. Estimated cost of such work, include	66,000 33 2,000 0,0664 or overhaul, general
Original cost of truck, new Trade-in value, present	
PURCHASE: 1 3-ton Great Six, six-wheel truck to repla retired. Present original cost Trade-in allowance, old truck	\$2,700.00
Net cost	\$2,300.00 550.00
Total	\$1,850.00
Expected yearly mileage, new truck (miles) Expected operating cost per mile, first year Expected saving, cost per mile, first year Total expected saving, first year	0.0400



"Wise spending, sure saving"

Disregard for quality in favor of price is often too easily acquired in times of business depression.

Quite naturally, some car manufacturers have been extremely wary of Lockheed Hydraulic Brakes because they are higher priced.

On the other hand, others have been agreeably surprised to learn that Lockheed Hydraulics are low cost equipment; and the reasons: low cost of assembly and simple adjustments that are final. The latter is important to the dealer because he is relieved of the expense of conditioning brakes before and after delivery—which expense, after all, must be considered a part of the cost.

HYDRAULIC BRAKE COMPANY DETROIT, MICHIGAN, U.S.A.

LOCKHEED HYDRAULIC Four BRAKES Wheel



AUTOMOTIVE FLASHES

Sterling Acquires LaFrance-Republic

The Sterling Motor Truck Co. has completed negotiations for acquisition of the truck division of the LaFrance-Republic Sales Corp. E. M. Sternberg, president of Sterling, said the lines of both companies would be continued, with Sterling producing heavy-duty trucks, while LaFrance-Republic would continue to build light and medium capacity trucks. Relative to the sales organization he said: "Our sales activities have been concentrated through a group of branches in metropolitan cities, while LaFrance-Republic maintained a substantial dealer organization throughout the United States and abroad. The combination will constitute a substantial sales and service organization for both lines."

Tough Break for Ed Loomis

Edward Loomis, secretary, Motor Truck Committee, N.A.C.C., had both legs fractured when his car skidded on a gravel road, swerved into a ditch and crashed into a tree. Mrs. Loomis and two guests escaped injury. The accident occurred July 2. Mr. Loomis is doing well in Noble Hospital, Westfield, Mass.

To Halt "Free Service"

I.C.C. Examiner O. L. Mohundro recently recommended that wasteful practices of railroads in loading and unloading freight by crane and other equipment without charge to shippers be brought to an end with a uniform schedule of charges.

A 435-Truck Award

The White Co. has received an award of 435 six-cylinder trucks from the United States Postoffice Department; 275 of these chassis were bid in at \$1,140 each and 160 at \$1,990.

E Pluribus Unum

Leading trailer manufacturers are working on the reorganization of the Trailer Manufacturers Association to present a more united front on the part of trailer makers to legislative discrimination aimed at them.

May Truck Sales

May factory sales of trucks made in U. S., according to the Bureau of Census, were 27,393, compared with 27,389 in April; 45,688 in May, 1931, and 58,659 in May, 1930.

Hansen Pictures Hardware

How the complete line of Hansen refrigerator body hardware is used is illustrated in the June house organ of the A. L. Hansen Mfg. Co., 5037 Ravenswood Avenue, Chicago.

N.A.C.C. Reelects

Alvan Macauley was reelected president of the National Automobile Chamber of Commerce at the annual meeting. Other officers reelected include: Alfred H. Swayne, A. R. Erskine, A. J. Brosseau, Alfred Reeves, Pyke Johnson, vice-presidents; Charles W. Nash, secretary, and F. J. Haynes, treasurer.

Keeping High

The Firestone Tire & Rubber Co. made a net profit of \$1,639,739 for six months ending April 30, after interest charges, taxes and Liberian expenses, and declared the regular dividend of 25 cents on common stock. This compares with a profit of \$2,908,553 for the same period last year.

Keeps Record Up

May Reo Speedwagon and truck sales in 31 states were ahead of corresponding sales for the same period last year. This is the 11th consecutive month that Reo truck sales have recorded gains.

A Break for Brakemen

A 50-page booklet giving information on brakes and brake problems is being offered by the Raybestos Division of Raybestos - Manhattan, Inc., Bridgeport, Conn. It is entitled "The Service Reference Manual."

New Waukesha Line

A new line of engines, known as the Full-Power line, has been introduced by the Waukesha Motor Co. Production will shortly be started on three sizes of six-cylinder engines, rated at 90, 110 and 125 hp.

Big Percentage Increase

Body division of the Federal Motor Truck Co. reports a 70 per cent increase in business over a similar period last year.

PERSONNEL CHANGES

© Bruce V. Kellar has been appointed advertising manager of Aluminum Industries, Inc., Cincinnati. Mr. Kellar, eight years assistant advertising manager of Timken Roller Bearing Co.. succeeds R. C. Glandorf, transferred to Chicago district.

• W. A. Knuckey, who has been manager of all northern California activities of the Fageol Motor Truck Co. for 12 years, has been appointed vice-president and general manager of the San Francisco branch of the Sterling Motor Truck Co. He replaces temporary manager W. J. Mildrum, who has been transferred to the Philadelphia branch of Sterling.

© C. C. Carr has been appointed head of the dealer accounting department of Chevrolet Motor Co., succeeding J. E. Johnson, who has returned to the field as manager of the Baltimore zone, replacing J. F. Murphy, who goes to Los Angeles, succeeding P. F. Minnock on leave account of sickness.

© C. K. "Curt" Brauns, 48, since 1913 a representative of Chilton Class Journal publications, died late in June. He was widely known and a personal friend of many leading executives and pioneers of the automotive industry.

© Benjamin G. Eynon, Commissioner of Motor Vehicles of Pennsylvania, has been placed in charge of the recently formed Street and Highway Safety Committee of the State. Bureau details will be handled by R. H. Stickel under the title of director.

☼ International Harvester directors elected James R. Leavell, John Stuart and William S. Elliot to the board to succeed Arthur Reynolds, resigned, and Thomas D. Jones and Henry B. Utley, deceased.

Appointment of R. C. Darnell as chief engineer and promotion of C. R. Richmond to production manager are announced by Arthur A. Bull, president of the Handy Governor Corp.

♦ Ted Rodgers of Scranton upon his return from Paris will take office as president of the Pennsylvania Motor Truck Association, succeeding J. R. Bingaman of Reading.

Harry A. Kaufmann, formerly sales manager for Fargo trucks, has been appointed director of service for the Chrysler Sales Corp.

Harry B. Hamlin, credit department manager, has been promoted to the office of assistant treasurer of the Goodyear Tire & Rubber Co.

☼ E. F. Connelly has been chosen manager of the General Motors Management Service of Canada, Ltd.

A Service for Readers

Commercial Car Journal is prepared to serve readers who desire legislative information pertaining exclusively to motor trucks. State your problems clearly and in detail and address your communication to the Editor. Replies will be mailed as quickly as the information can be procured.



A.A.A. Model Liability Law in Modified Form Shows a Gain in Preference Among

FINANCIAL RESPONSIBILI LAWS GROUND OUT IN

States Having Model A.A.A. Law*: Laws

- 1. California
- 2. Connecticut
- 3. Delaware
- 4. Indiana
- 5. lowa
- 6. Maine
- 7. Maryland
- 8. Minnesota 9. Nebraska
- 10. New Jersey
- II. New York
- 12. N. Carolina
- 13. Rhode Island
- 14. Vermont

or

he

an-

- 15. Wisconsin
- *Modified in most

States With Compulsory Insurance:

- 1. Massachusetts
- States With Other Responsi-
- bility Laws: 1. New Hampshire
- 2. N. Dakota
- 3. S. Dakota

- States Without Responsibility

 - I. Alabama 2. Arizona
 - 3. Arkansas
 - 4. Colorado
 - 5. Dist. of Col.
 - 6. Florida
 - 7. Georgia 8. Idaho
 - 9. Illinois
 - 10. Kansas
 - 11. Kentucky 12. Louisiana
 - 13. Michigan
 - 14. Mississippi
 - 15. Missouri
 - 16. Montana
 - 17. Nevada
 - 18. New Mexico
 - 19. Ohio
 - 20. Oklahoma
 - 21. Oregon
 - 22. Pennsylvania 23. S. Carolina
 - 24. Tennessee

 - 25. Texas
 - 26. Utah
 - 27. Virginia
 - 28. Washington 29. W. Virginia
 - 30. Wyoming

ESPONSIBILITY of the operator or owner of a motor vehicle for payment of damages which may result from an accident involving the vehicle came very much to the fore in the attention of legislators meeting in the various states during 1931. In most cases the attention of the legislators was directed toward requiring such persons whose vehicles have actually been involved in such an accident to furnish some sort of satisfactory evidence that they are able to meet damage claims up to a certain limit before permitting them to operate on the highways further. Some states did introduce bills calling for compulsory insurance, along the lines of the law in force in Massachusetts, but in none of these states did this law receive

serious consideration. Most of the laws actually enacted last year were based more or less closely on the model law proposed by the American Automobile Association, many of them following this model in exact detail, while others varied in comparatively minor details. Some of those states which already had financial responsibility laws altered them this past year so that they conformed more nearly to the "Three A" lawusually by removing some of the misdemeanors (usually minor) for which proof of responsibility may be required.

This model law requires that an

owner or operator of a motor vehicle shall have his license revoked unless he can furnish proof of financial responsibility up to certain specified limits in case he is convicted of certain violations of the motor vehicle law of the state. These violations include, specifically, driving while under the influence of intoxicating beverages or narcotic drugs; homicide or assault with a motor vehicle; reckless driving resulting in injury or loss of life; leaving the scene of an accident without making the necessary reports; driving without an operator's license; driving an unregistered vehicle; or violating any other provision of the motor vehicle law which calls for the revoca-tion or suspension of the license. It would also require such proof on failure to satisfy a judgment of more than \$100 resulting from damage caused by a motor vehicle accident.

The model law further requires that the proof of ability to pay be for at least \$1,000 for property damage resulting from any one accident, and at least \$5,000 for injury or loss of life to one person or \$10,000 altogether for this class of damage resulting from any one accident. This assurance may be in the form of an insurance policy issued by some company licensed by the state's insurance department; a bond issued by some surety company licensed to operate within the state; a bond guaranteed by at least two

persons owning real estate within the state; cash or some other form of acceptable collateral. This assurance is required for a period of three years after the conviction, after which, if the record has been clean, it may be discontinued.

In the matter of judgments arising from an accident, the law considers itself satisfied if the amounts specified above are paid on the judgments, even though the judgments are for greater amounts. Non-residents accepting the privilege of operating within the state under the reciprocity agreement existing are considered as automatically appointing the secretary of state or similar officer as their representative for the service of legal papers required in such cases. In many cases, too, the laws, especially as enacted last year, further provided that cars or operators registered within the state who are convicted in another state or any of the above provisions, also come under this law.

States adopting the model law, some of them with variations, last year were Delaware, Indiana, Nebraska and North Carolina. Delaware varied the law to include convictions of perjury or false affidavits made to the department of motor vehicles or in connection with any law affecting motor vehicles or in connection with any law affecting motor vehicles, felony, conviction of orfeiture of bail on three charges of reckless driving within the period of one year, and conviction of failure to stop after an accident. This state also allows a period of grace of 30 days for the payments of budgments.

Indiana adopted the model law without change.

dgments.
Indiana adopted the model law without change.
beraska included the conviction of licensees in other
ates, and North Carolina allows the 30-day grace

states, and North Carolina allows the 30-day grace period.

A number of the other new laws were based primarily on the model code, but in the other states nearcing new laws last year, the variations were much more marked than in the instances already listed. Thus Maryland has a new law which is not as broad in its coverage as the model one, but makes the provisions for unpaid judgments more severe. This law covers owners, drivers and chauffeurs convicted of operating while under the influence of intoxicating liquor or narcotic drugs, operating in violation of any law with results that bring about the death of any person, and leaving the scene of an accident. It also provides for the furnishing of evidence of financial responsibility in the event of a judgment of \$50 which remains unsatisfactory for 30 days.

South Dakota has a new law requiring financial responsibility in cases of reckless driving, driving while intoxicated and failure to stop after an accident. It also requires as a part of any judgment arising out of a motor vehicle accident the putting up, in some form, of \$2,000 to guarantee the payment of damages, either property or personal, arising from future accidents.

Wisconsin has a new law which, while based on

accidents.

Wisconsin has a new law which, while based on the A.A.A. model law, has been widened to include almost every possible cause in its requirements. Thus it apparently includes those propelling push carts or riding bicycles or animals who fail to obey traffic regulations; motor vehicle operators who fail to give

half of the road when meeting other vehicles; those who make a turn not according to prescribed regulations; parking wrong; and a whole gamut of petty offenses up through the more serious offenses resulting in Injury or death, including all of those listed in the model law. The amounts of responsibility required in this law correspond to the model law.

In addition to those states which enacted new laws this year, there were a number that altered existing laws. Connecticut, for example, listed more specifically than heretofore the offenses, conviction of which will call for the supplying of evidence of financial responsibility. This state also included the foreign clause requiring this evidence from those convicted in other states or provinces of any of the listed offenses. New Jersey, which formerly had a very broad law, narrowed it so that it coincides more nearly with the model law, by limiting the causes for which this type of evidence may be required to convictions of driving while under the influence of liquor or drugs, leaving the scene of an accident, reckless driving, homicide or assault with a motor vehicle, or any cause which calls for the revocation or suspension of license according to the motor vehicle law of the state. This law still does, however, cover anybody who may be involved in an accident in any way, unless the Motor Vehicle Commissioner is convinced that such person was in no way at fault.

New York also revised its law to include homicide or assault with a motor vehicle, reckless driving resulting in injury or death to property or person, violating the speed laws with results disastrous to life or property, driving without an operator's license or under the influence of liquor, leaving the scene of an accident, or violating any of the local ordinances covering reckless driving. This new law gives a 15-day grace period for the satisfaction of judgments, and has incorporated the foreign clause frequently referred to. California, which formerly required proof of financial responsibility on

Bureau of Mines by every consignor of liquid fuels. Report would be made available to state tax collectors. GEORGIA

Reports from Atlanta indicate that the larger cities of the state are seeking to obtain authority to levy municipal gasoline taxes of three cents per gallon. This would bring the total levy to 10 cents on every gallon of gasoline: state tax, three cents; federal tax, one cent; municipal tax, three cents. This would constitute a 100 per cent tax. More than 125 communities of Alabama, 50 in Missouri, three in Florida, one in Louislana, and four in New Mexico now levy city gasoline taxes. INDIANA

Farmers in Spencer county, Indiana, are home-

munities of Alabama, 50 in Missouri, three in Florida, one in Louislana, and four in New Mexico now levy city gasoline taxes.

INDIANA

Farmers in Spencer county, Indiana, are homebrewing their gasoline to evade the state gasoline tax of four cents and the federal tax of one cent. When the price of crude oil dropped the farmers set up crude refinerles or stills—some costing as low as \$50. When state inspectors announced the home brew was subjected to the tax some farmers dismantled their plants but others arranged partnerships to justify the expense of bond and license.

MARYLAND

Injunctions have been filed in Baltimore to restrain the Commissioner of Motor Vehicles of Maryland from enforcing an obscurely-written law which puts public truck carriers, operating on fixed schedules or between fixed points under the jurisdiction of the Public Service Commission, and subjects them to a tax of one-fifth of a cent per mile.

MISSISSIPPI

Mississippi has raised its gasoline tax rate to six cents per gallon from five and one-half cents and has put into effect what is probably the most drastic gasoline tax law yet devised to protect the state against loss caused by gasoline bootlegging, racketeering and other forms of tax evasion. All gasoline handled must be reported monthly. Distributors and dealers are licensed and bonded. Receipt or delivery of gasoline between the hours of 9 p.m. and 5 a.m. is construed as prima facie evidence of violation of the law or attempt to evade taxation. Emergency deliveries within these hours are permitted if authorities are notified. Common carriers and others transporting motor fuel into the state must file detailed reports on all shipments. All vehicles carrying motor fuel must carry detailed papers giving ownership and other information. Failure to have papers aboard may lead to arrest of operator, impounding of cargo and assessment of full tax plus 100 per cent penalty, plus costs. Arresting officers are entitled to 50 per cent of taxes due as commission.

NEW JERSEY

The Legislature

Governor Pinchot is reported to have requested an investigation of heavy trucks and trailers. State officials are to investigate the advisability of levying a tax on trucks and buses to reduce the number now on the highways.

When Should a Piece of Equipment Be Retired?

CONTINUED FROM PAGE 40

however, is up to the operator, to be determined from his own cost records.

It must be understood, of course, that you cannot attempt to set any definite standards of age or mile limitations for all classes of vehicles by class for all types of work. This would be plain suicide. But the principle of deciding on when your own vehicles in your own industry are ready for the heap is something that can be standardized to a sufficient extent to allow each operator a basis upon which to calculate.

In addition to the costs that your auditor slides off his pen point for you to examine every week are those elusive hidden costs that can't always be drawn in ink. The older a vehicle gets, the more susceptible it is to the scourge of truckdom-field failure. It doesn't matter what line of business you're in with a fleet, failures in the field are costly one way or another. Either you're holding up large crews of men, you're failing to deliver materials on time, you're breaking contracts, hurting your public relations, or what-not. And one sure way to court this kind of cost is to operate vehicles beyond a reasonable age.

The first necessity to a regular, businesslike replacement program is, of course, the cost-accounting system.

The second requirement is to survey the fleet, make proper vehicletype and work-type classifications.

After your cost system has been in effect for a sufficient length of time you've got to study your immediate situation and the prospective future business. Let your imagination run around and frolic a bit-but don't let it get out of hand. Study your cost on individual truck operations.

Take your oldest trucks-or those with the greatest mileage—and see how they could be improved upon in the type of work they are doing. Then figure what new truck on the market could take its place economically.

Figure the estimated operating cost of such a new truck for the first year. Realize that you'll have little or no repair bills due to ordinary wear and tear, and that you will have absolute dependability on the road. And how much better it will look-a big aid to your public relations.

Then go ahead and make yourself up a little improvement requisitionput down all the figures. A sample is shown on page 40.

Inasmuch as the table is merely a

sample, the figures are not accurate, but only represent approximations to show how requisition will appear.

The adoption of a retirement program will require considerable time and study, but when you have slaved away at it for a while you will soon be able to make all necessary adjustments, and you'll find yourself in possession of a standard basis in your own fleet for retirement for all classes of vehicles for all classes of work. From there on it's clear sailing.

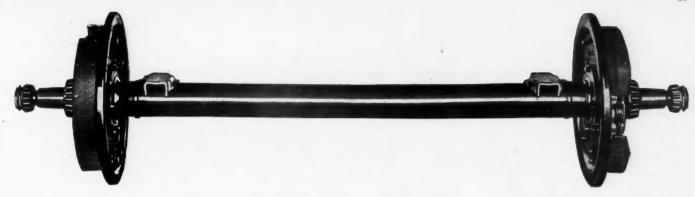
Motor Freight Tariffs Are Basis of Stability

CONTINUED FROM PAGE 37

freight transportation companies operating in Washington, Oregon and The tariff of this association is filed with the Department of Public Works of the State of Washington, and is governed by the uniform motor freight classification prescribed for use of all intrastate motor freight carriers in the State of Washington by the Department of Public Works of that state. The concurrence of each carrier binding it to the rates, rules and regulations in the tariff is filed by the tariff publishing association with the Department of Public Works, as required by the state law.

Another agency type of tariff is issued by Lewis A. Monroe, who functions as rate and tariff expert for a group of 150 carriers of motor freight in California which use a uniform system of classification and tariffs, thus greatly facilitating the development of rates, routes and service.

Uniformity in motor freight tariffs and the publication of tariffs by groups or associations for motor carriers is highly desirable. The joint system of publication tends to reduce the cost of compiling, publishing and distributing the tariffs. It tends to promote uniformity and certainty, and the tariffs, if they are accurate, complete and attractive, serve as advertisements for the carriers.



These TUBULAR AXLES are stronger . . . much!

No trailer axle with square or rectangular section beam will compare with a Timken Tubular Trailer Axle of like capacity.

This is not just a thought on the subject. It is easily provable; and we proved it.

Timken Tubular Axles have less deflection of beam; due to greater moment of inertia.

Result—big tire economies; for even minor deflections cause irregularity of tire wear.

They are stronger—in load capacity,

in withstanding braking torque; and weigh much less.

They are fully brake-equipped; any type of brake specified.

Specify these better axles on new trailers. You can also modernize your present fleet of trailers with these axles. We'll give you the name of the Timken Axle distributor nearest you. Every distributor is factory trained and fully equipped to make engineered installations. Write us for information.

THE TIMKEN-DETROIT AXLE COMPANY
DETROIT MICHIGAN

TIMKEN AXLES



nd

on lic

n, or

or

ht on

ks

of

is

lic

ate

nca sht rm

iffs by arint uce and to and om-

rnal

Uncle Sam Evaluates Truck Bids on Points

CONTINUED FROM PAGE 21

value of each element is established according to its importance in relation to the other 18 elements (see box

on page 21).

The points (or weight) given in the second column are maximums, and each element is rated from one up to the maximum listed, according to the information listed by the questionnaire. The truck receiving the most points will be considered the lowest bid meeting the specifications and service requirements. The points used in the chart are determined by the purchasing department and must be shown in the specifications at time of issue.

One of the big problems in the development of an evaluation chart is deciding what items should be in-cluded. Obviously, to be practicable, the number of items cannot be too large, and yet the number should be sufficiently broad to permit covering every important feature of truck design, operation, company reputation, cost and servicing facilities. In the Federal chart the elements have not only been held down to a reasonably small number, but are, in addition, well balanced. For example, there are eight elements on design totaling 517 points; three elements on rating totaling 140 points; four on reputation and performance totaling 139; two on service facilities totaling 103, and two on price totaling 101. Main consideration, and properly so, is given design, but the board decided to proportionately credit the other groups mentioned to assure all-around value. Low price is not neglected, but it alone cannot win a high truck rating. Under the plan, quality cannot be sacrificed for price.

The difficulty of evaluating trucks assembled from a large list of individual units, manufactured by different organizations and serviced under different methods is readily apparent. For example, the cubic inch displacement in the engine of one truck may be smaller than that of another, but the latter may have a four-speed transmission instead of a three. Both may be good trucks, but how shall they be graded? Again, hydraulic brakes may be preferred, but a certain truck with excellent horsepower specification is equipped with mechanical brakes. How shall the truck be evaluated? More questions: How important is the ready availability of repair parts and service facilities in relation to elements of design? How does a cab door hinge stack up against frame dimensions? Selection of the truck may not be a question of good or bad, but a question of the greatest value for the money. It's like a beauty contest. The entrants are all goodlooking girls-not an ugly one in the bevy-but there's a best and it's up to the judges to determine that best. The answer is a chart—specifications of standards.

To properly catalog all these variable values, giving and taking credit according to the merit of each individual element, in order to arrive at a reasonable conclusion of merit for the whole, quite obviously is not easy without some system of marking. If they were rated equally, an inaccurate valuation would result, for it is readily apparent that a large number of high ratings for minor items might easily counteract the advantages of a lesser number of major items and place a truck which does not give as great value as another in a higher position.

To meet this situation the Federal Board placed different ratings on each of the 19 elements in its chart accord-

Specifications Recommended

(SEE PAGE 21)

Engine:

Make Model

(A) Number of cylinders

(B) Cubic Inch Piston Displacement

(C) Max. Brake Horsepower at R.P.M.

(D) Max. Torque, Net b. ft.

(E) Size of Crankshaft

(F) Number of Main Bearings

(G) Projected Area of Main Bearings Exclusive of Fillets and

Oil Grooves in.
(H) Max. Governed Speed;
Normal

ing to its relative importance. It placed the engine at the top of the list with 100 points; the rear axle at 98: tires are rated at 72 and frames at 36, etc. (the alphabetical listing in the chart gives the order of rating from high to low). These various values are based on experience of the department, technical data and performance tests. Many fleet operators may differ as to the justification of the gradations. In fact, the nature of service, the place where truck is to be operated and other factors undoubtedly would require some changes in the ratings. But this depends on circumstances. The fact remains that the variable rating of elements reconciles major and minor items and permits a logical addition of all the truck's characteristics.

Trucks Wheel Factories Right to Food Sources

CONTINUED FROM PAGE 20

course, the crop should be bad in that locality. In that case factory would move into more fortunate district.

In southern New Jersey during early fall more than 1000 acres of lima beans are ready. Two five-ton trucks, bearing portable freezers, arrive. Two are required to handle the unusually large crop. The freezers are set up in one corner of the building which also houses canning equip-

ment. The canning factory is there all year around. In this case the canning factory is busy practically all summer and well into fall, due to the great variety of produce raised in this section. Without the portables, however, the stationary factory would have been swamped. Together the job is done in a few weeks and the portable factories again take leave.

The portable now turns to New York State, where corn is ripe. After that, up in Vermont, the turkeys will be ready in early November. The same portable that packed delicate strawberries can also be employed to handle the clumsiest of turkeys.

As the portable factory idea gets into full swing an itinerary can be readily devised to include assignments such as the following: January and February, Gloucester, Mass., to prepare fish; March, Florida, to pack pompano and vegetables; April, Louisiana, to quick-freeze shrimp; May, Texas, to put up spinach; June and July, to brick strawberries, following the crops northward; September, New Jersey, to preserve baby lima beans: October, New York, to pack fruits and vegetables; November, Vermont, for turkeys; December, New England and Long Island, to freeze oysters and lobsters, to be stored for the now forbidden summer months.

Valuable research in the frozen-food field is being conducted by the agricultural experiment stations in a number of widely scattered states.

The work which has been going on for a number of years in the experiment station at the United States government station maintained in Seattle, the Georgia Experiment Station, Experiment, Iowa, and the University of California, Berkeley, Calif., has received much deserved publicity. These three stations and others have contributed greatly to the development of frozen foods.

The agricultural station at the University of Florida, in Gainesville, has been engaged in studying the freezing qualities of a number of fruits which are rarely seen in their fresh form in other sections of the United States.

At Amherst, Mass., the experiment station at the State College has been experimenting with frozen cranberries, in addition to other fruits.

Cider has been frozen successfully at the agricultural station of the University of Minnesota. This station has also done considerable work with rhubarb, the frozen rhubarb being used for pies. Raspberries, especially the Latham raspberries, strawberries, plums, peas and corn also have been frozen experimentally.

One of the products which has proved difficult to freeze successfully is corn. The agricultural experiment station at the State College, Fargo, N. D., has undertaken a program of experimentation in the freezing of sweet corn, and although nothing yet has been published, has completed some interesting tests which indicate considerable commercial possibilities.

How the Truck, Parts and Tire Taxes Will Be Paid

CONTINUED FROM PAGE 17

11

0

n

s,

d

e

w

11

1e

te

to

ts

be

ts

ıd

ck

u-

y,

nd

ng

nd

or

nd

b-

d-

od

ri-

on

ri-

es

e-

a-

ni-

f..

ty.

ve

p-

ni-

as

ng

ich

in

es.

ent

en er-

lly

ni-

nas

nu-

sed

the

ies,

een

nas

illy

ent

go,

of

of vet

ted ate

ies.

facturer of the tires and tubes that are on the truck would be, say, \$20. The manufacturer would be permitted to take credit against the \$10 tax of two per cent of \$20, or 40 cents, making the net tax \$9.60. This credit is to be taken from the taxes paid by truck manufacturer to government.

In the definition of original equipment, says a general bulletin issued by the National Automobile Chamber of Commerce, the present view is that a fifth tire sold on or in connection with the vehicle is subject to the vehicle tax, and consequently the manufac-turer of the vehicle is entitled to a credit refund against the tire tax.

Average weights probably will be determined for each size of tire and tube by the Bureau of Internal Revenue with the tire makers.

Lubricating Oils

A tax of four cents a gallon attaches to all sales of oil of any type commonly or commercially known as lubricating oils or commonly used for lubricating purposes. Ordinarily the term "lubricating oils" will be understood not to include a product of the type commonly known as grease.

Gasoline

A tax of one cent a gallon is payable by the importer or producer of gasoline, benzol and other motor liquids, the chief use of which is as fuel for the propulsion of motor vehicles.

Direct shipments made to a dealer operating in a territory which is under exclusive contract to a distributor are taxable at the price applicable to the distributor.

The question of whether conditional sales made prior to enactment of the Revenue Act are taxable for the unpaid portion of the contract is under review by the revenue bureau.

The manufacturer is entitled to list the tax separately on his invoice or to include it if he prefers in his selling price. If he lists it separately he must state the exact amount of tax to be paid. No estimates are allowed.

All automotive taxes expire July 31, 1934. Any article on which the tax has been paid, which on Aug. 1, 1934, is held by a dealer and intended for sale, is subject to a floor tax refund in the amount of the tax paid.

Since the taxes are levied against manufacturers, any motor vehicles, accessories, parts, tires, tubes, etc., held by distributors, jobbers, dealers or others engaged in the distribution of these goods, are not taxable if the title to them has passed from the manufacturer before the effective date of the act, June 21, 1932.

"Inflated List Prices Should Be Exploded"

CONTINUED FROM PAGE 26

Here's another vicious practice that has no parallel in any other business. An employee in a trucking company, having access to the business of his employer, desiring to go into business can approach a truck salesman and purchase for a few hundred dollars equipment worth thousands. Thus set up in business he immediately seeks to take away the business of his former employer by rate reductions. This demoralizing situation is not an

exception, it is the rule.

I will not name any particular company regarding my charge that truck makers fail to comply with size and weight restrictions, but necessary proof of my statements are available to those interested. With but two exceptions state regulations require vehicle width not to be greater than 96 in., although two more states have provisions for change-overs from solids to pneumatics and one for duals. Yet in the past and at present trucks are being sold in width dimensions greater than the legal limit. Trucks are built to permit an operator to carry a given load and remain within the laws. But if such a load is carried the overall weight is greater than the law allows on the highways of

My charge that many of the developments now found on trucks were forced upon the manufacturer through operator insistence is based on personal experience. In fact factory engineers frequently seem to have a lot of trouble wrestling with the problems of new ideas. For example, in 1922, manufacturer was instructed to build a special armored truck. After months of study the engineers of this manufacturer stated that armored cabs and bodies could be built to remain within the weight limits of the law. The calculated weight was 5600 lb., whereas the actual weight of the completed job was 9700 lb. Yet they

claim to be engineers.

Examples of operator pioneering and later manufacturer acceptance are many. In the early days of bus operation we were compelled to go to the West coast for a piece of equipment not built on a truck chassis. Our move was regarded with derision but when the equipment was delivered, Eastern engineers kept in close touch with the innovation. Within one year the same feature was incorporated in their designs. In the same year certain leading manufacturers were requested to build a large six-cylinder five-ton truck to climb hills at fairly good speeds in high and provide better acceleration. Stating that the request was impractical and foolish it was refused. A small company, however, was finally induced to build such a unit. Its performance was remarkable. This company, also adverse to the idea six months previous, im-TURN TO PAGE 60, PLEASE

RECOMMENDED METHODS OF LISTING TAXES

A-Truck Factory Invoice to Dealer		C-Parts Maker Invoice to Wholesale	r
1 Truck	30.00 30.00 8.00	100 Valves @ \$1.00 Less 60%	\$100.00 60.00
Federal Taxes on Truck, Accessories and Tires	17.89	NetFederal Tax, 2%	\$40.00 .80
-	805.89	Total	\$40.80
		D-Wholesalers to Dealers	
		3 Gaskets 1 Flywheel Gear 10 Spark Plugs 4 Pistons	\$2.25 4.00 7.50 16.00
		Less 30%	\$29.75 8.93
B—Truck Dealer's Retail Invoice		Net	\$20.82 3.25 3.00
1 Truck\$1 Bumpers and Accessories Spare Tire and Tube	,000.00 40.00 12.00	*Tax (or Manufacturer's Price Increase), 2%	\$27.07 .54
Freight and Handling Federal Taxes on Truck, Acces- sories and Tires	50.00		\$27.61
_		†install Flywheel Gear	1.50
\$1	,119.89		\$29.11
Example of Itemized Comp	outation	of Federal Tax in A and B	
Assumed Typical Truck \$1,000 Bumpers and Accessories 40 (Excl. Spare Tire)	25% 25%	\$7502% 302%	\$15.00 .60
4 Casings (Weight 80 lb.) 4 Tubes (" 12 lb.) 1 Spare Tire (" 20 lb.)		\$0.02½ per lb. 0.4 per lb. 0.2½ per lb. 0.2½ per lb. 0.4 per lb.	1.80 .48 .45 .12
		All o	\$18.45
LESS Manufacturer's Credit on Tir 4 Casings and Tubes, Cost \$20.00 1 Spare Tire and Tube, Cost 8.00	per set.	2%\$0.40	.56
			\$17.99

^{*}Motor and Equipment Manufacturers Association and National Standard Parts Association recommend that the price increase notation be used in order to avoid the possibility of penalties in cases where one manufacturer acquires a portion of his finished articles from another manufacturer.

†Showing no tax added to labor charge.

COMMERCIAL CAR JOURNAL'S

CORRECTIONS ARE MADE EACH MONTH FROM DATA SUPPLIED DIRECT BY TRUCK MAKERS +

	a	ENE	RAL	(Se	e Keynote)	TIRE	SIZE			MAJO	R	UNI	TS					FRAM	E
				peu	the	(ped)			ENG	NE	TRANSMI	SSI	ON	REA	R A	XLE			suc	
MAKE AND MODEL	Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Aux. Location and Speeds	Make and Model	Gear and Type	Drive and Torqu	In High	In Low SOL	Side Rail Dimensio	Type
A.C.F. 16 A.C.F. 175 Am. LaF Big Ch.1 175 Am. LaF Big Ch.1 175 Am. LaF Big Ch.1 18 18 18 18 18 18 18 18 18 18 18 18 18	16 6 2 3 4 5 7 9 1 1 1 2 2 1 3 3 4 5 7 9 1 1 1 1 2 2 1 3 3 4 5 7 9 1 1 1 1 2 2 1 3 3 1 3 4 5 7 9 1 1 1 1 2 2 1 3 3 1 3 1 5 7 9 1 1 1 1 1 1 2 2 1 3 3 1 3 1 5 7 9 1 1 1 1 1 1 2 2 1 3 3 1 3 1 5 7 9 1 1 1 1 1 1 2 2 1 3 3 1 3 1 3 1 5 7 9 1 1 1 1 1 1 2 2 1 3 3 1 3 1 3 1 5 7 9 1 1 1 1 1 1 1 2 2 1 3 3 1 3 1 3 1 5 7 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	8300 6722 1187 2744 3056 3356 3356 3356 3459 3159 11599 11599 11599 1237 3155 465 465 4465 4465 4465 4465 4465 446	D) 1866 226 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 2 3 5 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	24300 24300 24300 24000 24000 24000 10000 10000 12000 14000 18500 23000 19315 28000 19315 28000 100000 100000 100000 100000 10000 10000 10000 10000 10000 10000 10000 10	10750 4771 11610 10000 4783 4780 4777 47900 4783 4560 4550 4777 4700 488 480 481 481 481 481 481 481 481 481 481 481	B9.75/22 B10.50/22 B10.50/22 B10.50/22 B10.50/22 B10.50/22 B10.50/24 P40x8 B7.00/20 B9.75/20 B8.25/20 B9.75/20 B8.25/20 B9.75/20 B9.75/20 B9.75/20 B9.75/20 B9.75/20 B9.75/20 B9.75/20 B9.75/20 B9.75/20 B8.25/20 B8.25/20 B8.25/20 B8.25/20 B8.25/20 B9.75/20 B8.25/20 B9.75/20 B9.75/20 B8.25/20 B9.75/20	B9.75/22 B10.50/22 B10.50/22 B10.50/22 B10.50/22 B10.50/22 B10.50/22 B10.50/22 B10.50/22 B10.50/20 B10.50/24 B11.25/24 B11.25/24 B11.25/24 B11.35/24 B11.3	Lye WTG Lye ASD Lye ASD Lye ASD Lye ASD Lye ASD Con 18R Lye ASD Con 18R Con 20R Con 20R Con 20R Con 21R Own SD Own M Own SCH Own SCH Own SCH Own SCM Ste LT-5-1128 Wau ZK Wau TL Wau MS Wau MK Wau 6AB Wau 6AB Con 27B Con 30B Con 30B Con 30B Con 30B Con 30B Con 34B Con 35B Own Own Own Own Own Own Own Wau MK Wau MK Wau GRB Con 35B Own	6-5x6 x6 66 63 34 x4 x6	BL 714 Own 16R Fu WOBB Fu MLU Fu MGU Fu MGU Fu MGU Fu MGU Fu MGU Fu WOG Fu VUOG Fu VUOG Fu VUOG Fu VUOG Fu VUOG BL 35-4 CoW4C BL 35-5 BL 51-5	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	OPP NOO NOO NOO NOO NOO NOO NOO NOO NOO	Tim 54200H Tim 56200H Tim 5520H Tim 56706H Tim 56706H Tim 65706H Tim 65706H Tim 6570H Tim 6570H Tim 5100H Tim 5200H Tim 5200H Tim 5200H Tim 5200H Tim 5200H Tim 5420H Tim 5420H Tim 5420H Tim 5620H Tim 66720H Tim 66720H Tim 66720H Tim 66720H Tim 66720H Tim 6720H Tim 6720H Tim 6720H Tim 6720H Tim 6720H Tim 5620H Tim 66720H Tim 66720H Tim 66720H Tim 66720H Tim 66720H Tim 56200H Tim 56200H Tim 56200H Tim 5620H Tim 66720H Tim 66720H Tim 56200H Tim 56200H Tim 56200H Tim 5620H Tim 66720H Tim 56200H Tim 5620H	B B B WF W WF SF 2F 2F 2F 2F	HRRRRRRRHHRHRRRRRRRUUURRRRRHHHHHH	6 6 8 4 4 4 8 8 5 5 6 6 6 8 8 5 5 6 6 6 6 7 7 7 7 8 8 8 5 5 5 6 6 6 6 7 6 6 6 6 7 6 6 6 6 7 6 6 6 6	42 2 43 .5 8 48 .8 8 48 .8 8 .8 .8 .8 .8 .8 .8 .8 .8 .8 .8 .8	8x3 916x214x46 6x3x46 6x3x46 7x3x46 6x3x46 7x3x46 7x3x46 816x3x46 7x3x46 816x3x46 7x3x46 536x334x46 536x334x46 536x334x46 536x344x46 536x344x46 6x24	CPPPPPPPPPCTTTTTTTTTCLCPPPPCCCCCCC
1-30 1-35- 1-35- 1-35- 1-35- 1-35- 1-35- 1-35- 1-35- E.	73-74 663-74 673-74	420 450 170 98 108 1306 295 237 44 44 487 551 1616 165 260 487 550 89 139 222 222 222 222 222 222 222 222 222 2	0 155 0 130 0 133 0 133 0 135 0 166 0 166 0 167 0 188 199 0 175 199 0 133 199 0 133 199 0 133 199 0 133 199 199 199 199 199 199 199	3 1 185 4 174 1 175 1 185 1 18	17200 19400 8500 8500 8500 10500 11900 14700 17500 121600 124800 13200 13200 14700 17500 24800 13200 14700 13200 147	6700 7000 3410 3207 3950 4870 4910 5870 6160 9200 1000 9200 1000 9200 3950 4200 4200 4300 6800 7600 9500 3100 9500 3100 9500 3100 9500 3100 9500 3100 9500 9500 9500 9500 9500 9500 9500 9	P32x6 P32x6 P34x7 P34x7 P34x7 P34x7 P34x7 P34x7 P34x7 P34x7 B6.00/20 B6.50/20 B6.50/20 B7.50/20 B7.50/20 P34x7 P36x8 B9.75/20 B6.50/20 B7.50/20 B7.50/20 B9.00/20 B7.50/20 B9.00/20 B7.50/20 B	DP32x6 DP34x7 DP34x7 P32x6 P32x6 P32x6 DB6.50/20 DP32x6 DB7.50/20 DB7.50/20 DB7.50/20 DP34x7 DP36x8 DB9.75/20 DB8.50/20 DB9.00/20 DB9.00/20 DB10.50/20 DB10.50/20 DB7.50/20	Bud DW6 Bud BA6 Gun BA6 Con 18E Con W10 Con 25A Con 25A Con 25A Con 16C Con E600 Con E600 Con E601 Con E601 Con E602 Con 20R Con 16C Con E602 Con 20R Con 16C Con 18R Con 21R Her JXA Her JXA Her JXA	10-03 a 205 6-4 i i i i i i i i i i i i i i i i i i i	BL 714 BL 35 BL 51 BL 51 BL 51 BL 51 BL 214 Ow 8T Ow 8T BL 214 BL 334 BL 335 BL 7212 BL 314 BL 315 BL 7212 WG T9 WG T9 WG T9 BL 314 BL 554 BL 554 BL 615 BL 754 BL 615 BL 754 CWG T9 CWG	מטטטט	No No No No	Wis 4610 Tim 65706D Tim 65706D Tim 65706D Tim 52200H Own 8R Own 8R Tim 53200H Tim 52200H Tim 52200H Tim 52200H Tim 52200H Tim 52200H Tim 55200H Tim 65706H Tim 65706H Tim 65706H Tim 65706H Tim 65200H Tim 65200H Tim 5220H Tim 65720H	RFF WFF BFF SFFF BBFF W/2 V 8/2 2 FF BBFF BFF BFF SFFF SFFF SFFF SFFF	12.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.	9.3 6.1 5.8 5.4 5.5 5.5 7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	32 49 32 49	10 x 3 x 1 \(\) \(\) \(\) \(\) \(\) \(\) \(\) \(\) \(\) \(\) \(\) \(\) \(CCCTPPTTTTTTTTTTTTCCCCCCCCCCTTTPB

TRUCK SPECIFICATIONS TABLE

+ FOR MEANING OF ABBREVIATIONS AND EXPLANATION OF REFERENCE MARKS SEE PAGE 58

			E	NGINE I	ET	TAI	LS					FU	EL ST.	EL	EC- CAL				FRONT		BR	AKES	3	BOD	MOU MOU	INT-	SPR	INGS	
lent	1	atio	H. P.	*	int			BEARI	NOS	, be				Make	r Make	Make				ake	SERV	ICE	Lion	ame	1.				
Piston Displacem	a de la companya de l	Torque lb. ft.	N A C.C. Bated	Max. Brake H.P R.P.M. Given	Valve Arrangement	Cams	Piston Ma	Numbe	Length	Oiling System Ty	Governor Make	Carburetors Mak	Fuel Feed	Ignition System	Generator, Starte	Clutch Type and	Radiator Make	Universals Make	Make and Model	Steering Gear Ma	Make, Location Type, Operation	ng Area	Hand Type, Location	o Rear	to R	Width of Frame	Front	Rear	Auxiliary Type
$\begin{array}{c} 5\ 24\ 3\\ 25\ 24\ 4\\ 25\ 25\ 4\\ 44\ 25\ 1\\ 44\ 4\\ 25\ 4\\ 44\ 25\ 1\\ 44\ 4\\ 45\ 24\ 4\\ 45\ 24\ 4\\ 45\ 24\ 4\\ 45\ 24\ 4\\ 45\ 24\ 4\\ 45\ 24\ 4\\ 45\ 25\ 4\\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 45\ 45\ 45\ 4\\ 45\ 45\ 45\ 45\ 45\ 45\ 45\ 45\ 45\ 45\$	77.44.58.44.84.51.54.55.51.54.55.55.55.55.55.53.33.44.54.84.84.84.84.84.84.84.84.84.84.84.84.84	$ \begin{array}{c} 4 & 50 \\ 5 & 36 \\ 5 & 77 \\ 12 \\ 22 \\ 23 \\ 24 \\ 24 \\ 24 \\ 24 \\ 24 \\ 2$	$ \begin{array}{c} 0 \mid 600 \\ 0 \mid 600 \\ 0 \mid 488 \\ 0 \mid 273 \\ 0 \mid 273 \\ 0 \mid 288 $	175-226 6 115-166 7 66-22 4 73-22 6 7 66-22 4 73-22 103-22 103-22 2 103-22 2 103-22 2 103-22 2 103-22 4 6 64-28 3 62-28 4 82-24 7 78-5-28 4 82-24 4 81-25 8 87-24 4 82-24 3 110-23 8 73-23 8 73-23	00 1 1 1 1 1 1 1 1 1	LLLLLLLLLLLLLHLHHHHLLLLLLLLLLLLLLLLLLL		7-2% 1	1404044444	CC FPC CC C	Haanno Moo Moo Moo Moo Moo Moo Moo Moo Moo	Str Zer Zer Zer Zer Zer Zer Zer Zer Zer Ze	MM V V V V V V MM MM MM MM MM MM MM MM M	DR REAL ALL ALL ALL ALL ALL ALL ALL ALL ALL	DR.	P.OW P.OW P.OW P.OW P.OW P.OW P.OW P.OW	Lo Lo Wyo You You You You You You You You You Yo	Spil Spi	Own Own Tim 30000H Tim 31000H Tim 31000H Tim 31000H Tim 31000H Tim 30020H Tim 26450 Wis CF15 Wis CF25 Wis CF25 Wis CF25 Wis CF30 Wis CF30 Wis CF30 Tim 15300 Tim 30000H Tim 330000H Tim 330000H Tim 35000A Tim 27450TV Tim 30020H Tim 33000H	Ros	ALIH LAIH LAIH LAIH LAIHV LAIHV	4404 4404	CCTYTYTYTYTTTTTTTTTTTTTTTTTTTTTTTTTTTT	0 1722 C Opt 0 1722 C Opt 1722 C	Opt	331 12 12 12 12 12 12 12 12 12 12 12 12 12	36x1 ½ 36x1 ½ 36x1 ½ 36x1 ½ 41 ½ x2 ½ 41 ½ x2 ½ 41 ½ x2 ½ 41 ½ x2 ½ 42 ½ 43 ½ 43 ½ 43 ½ 43 ½ 43 ½ 43 ½ 43 ½ 43	54x1 1/4 45x2 1/4 45x2 1/4 45x2 1/4 45x2 1/4 45x2 1/4 45x3 1/4 45x	

ournal

	.01	ENE	RAL	(See	Keynote	e)	TIR	E SIZE			٨	AAJ	OR	UNITS.				FRAM	E
,			se	hed	eight	(ped)			ENG	INE	TRANSM	ISS	ION	REA	RA	XLE		suc	
MAKE AND MODEL	Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Wei	Chassis Wt. (Stripped)	Front	Rear	Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Aux. Location and Speeds	Make and Model	Gear and Type	Drive and Torqu	EAR TIOS	Side Rall Dimension	Tvne
Diamond T504A	11/25 2-25 Kg	2650 2950 2950 3695 4925 4925 4925 495 495 495 495 595 495 595 595	1666 1769 1769 1769 1769 1769 1769 1769	208 2490 2496 2300 1099 2000 1031 1560 1860 2006 1861 1862 2000 1095 00 1095 00 1095 00 1095 00 1095 00 1095 00 1095 00 1095 00 1095 00 1095 00 1095 00 1095 00 1095 00 1095 00 1095 00 1095 1095	17500 17500 20000 20000 24000 18100	64202 66000 75400 9300 9300 9300 9300 9300 9300 9300 9	B8. 25/20 B8. 25/20 B8. 25/20 B8. 25/20 B9. 00/20 B6. 50/20 B6.	DB8, 25/20 DB9, 75/20 DB9, 75/20 DB9, 75/20 DB9, 75/20 DB9, 75/20 DB9, 75/20 DP30x5 DP30x7 DP34x7 DP34x7 DP34x7 DP34x7 P34x7 DP30x5 DB9, 00/20 DB11, 25/20 DB10, 50/20 DB10, 50/20 DB10, 50/20 DB30x5 DP32x6 DP32x6 DP32x6 DP32x6 DP32x6 DP32x6 DP32x6 DP32x6 DP32x6 DP32x7 DP30x5 DP30x7 DP30x5 DP30x7 DP30x5 DP30x7 DP30x5 DP30x7 DP30x5 DP30x7 DP30x6 DP32x6 DP32x7 DP30x7 DP30x7 DP30x6 DP32x6 DP32x7 DP30x7 D	Her WXC3 Her WXC4 Her WXC4 Her RXB Her WXC6 Her RXB Her WXC6 Her RXB Own	6-39-14-14-14-14-14-14-14-14-14-14-14-14-14-	CO RUS4C CO RUS4C CO RUSC CO R	UUUUU AUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU	\(\frac{0}{2}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(\frac{0}\)\(0	Wis 69317 BL Wis 69317 BL Wis 1237H Wis 1237H Tim 58205H Wis 1627 KW Wis 1627 KW Tim 58000H Own	TFFFFFFFKKKKKKKFFFFFFFKFFFFFFFFFFFFFFF	ROpt HOOpt H	Ont	6 1/2 x 33 x 1/3 x	CAPADA DO COCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCO

				EN	GINE DI	T.	AIL:					FUE	L T. T	ELE					FRONT AXLE		BR	AKI	ES		BODY	MOU	UNT-	SPR	INGS
Distant	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.C.C. Rated H.P.	Max. Brake H.P. at R.P.M. Given	Valve Arrangement	aft Dri	Number and Diameter	Length SDZ	Oiling System Type	Governor Make	Carburetors Make	P	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make	Universals Make	Make and Model	Steering Gear Make	Make, Location & Type, Operation	Lining Area	Drum Material	Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear
$\begin{smallmatrix} 1&3&3&4&5&3\\3&3&4&5&3\\3&4&5&3&3\\4&5&3&3&4\\5&2&2&1&3\\2&3&4&5&2&2\\2&3&2&2&3&4\\5&2&2&3&2&3&2\\2&3&2&2&3&2&2\\3&3&2&2&3&2&2\\2&3&2&2&2&3&2\\2&3&2&2&2&2$	39 9 9 9 9 9 9 9 9 9	444444496361616386217370005250513703555555532114445790050001001001000000000000000000000000	212 262 280 330 350 350 124 134 1134 1134 1134 1134 1134 1134 1	38. 43. 39. 448. 451. 432. 432. 432. 432. 432. 432. 433. 433	1				13 %	PC PPC CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	Навана в на в на в на в на в на в на в н	Zen	MILLE WILLIAM	ALALALALALALALALALALALALALALALALALALAL	ALNLALALLALALLALLALLALLALLALLALLALLALLAL	D.Co D.Co	GOGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG	Spi	Shu 5582B Shu 578 Shu 5582B Shu 678 Tim 33000H Own	Ross Ross Ross Ross Ross Ross Ross Ross	LAIHV LAIH	408 408	DDA a DA A DDDD DD	TODD TODD TODD TODD TODD TODD TODD TODD	126 138 138 138 138 138 138 138 138 138 138	80 1 87 88 87 87 88 88 88 88 88 88 88 88 88	34 34 34 34 34 37 37 37 37 37 37 37 37 37 37 37 37 37	45½ 12½ 45½ 12½ 45½ 12½ 45½ 12½ 45½ 12½ 45½ 12½ 45½ 12½ 46x3 35½ 11 35½ 11 35½ 11 39x2 39x2 39x2 39x2 42x3 45x3 45x3 45x3 45x3 45x3 45x3 45x3 45	56x3 56x3 56x3 56x3 56x3 56x3 56x3 56x3

Type

TODO TODO DO TODO POR DE PORTO DE CONTRETE DE CONTRETE

	G	ENE	RAL	(See	Keynote)		TIRE	SIZE			M	AJ	OR	UNITS					FRAM	E
		-		per	ħ h	(ped)			ENGI	NE.	TRANSMI	SSI	ON	REA	RA	XL	LE		suo	
MAKE AND MODEL	Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Roar	Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Aux. Location	Make and Model	Gear and Type	ive and	High	In Low	Side Rail Dimension	Type
Gramm	681002259	1695 1295 1295 1295 1295 1295 1295 1295 12	1	0 210 0 210 0 224 0 224 0 224 0 224 0 224 0 224 0 224 0 224 0 224 1 191 1 22 1 7 2 2 1 7 2 3 2 3 2 4 3 5 3 6 4 1 3 6 5 2 6 1 6 1 6 1 6 1 6 1 6 1 6 1 6 1 6 1 6 1	12000 12000 14000 14000 14000 14000 14000 17000 17000 17000 17000 18000 20000 20000 22000 15500 15500 15500 17500 17500 17900 13000 115500 115000 115500 115000	3950 4820 4820 4820 5100 5100 5100 5100 5100 6750 6750 6750 6750 6750 6750 6750 67	B6.50/20 B7.00/20 B7.00/20 B7.50/20 B7.50/20 B7.50/20 B7.50/20 B7.50/20 B7.50/20 B7.50/20 B7.50/20 B7.50/20 B8.25/20 B9.00/20 B9.00/20 B9.00/20 B9.00/20 B9.00/20 B9.75/20 B9.00/20 B9.75/20 B9.00/20 B9.75/20	DB6.50/20 DB6.50/20 DB7.50/20 DB8.25/20 DB8.25/20 DB8.00/20 DB8.25/20 DB8.00/20 DB8.25/20 DB8.00/20 DB8.25/20 DB8.25	Lyc ASD Con 16C Lyc ASD Con 16C Lyc ASD Con 21R Lyc ASD Wau ARK Wau MK Wau ASR Wau MK Wau MK Wau ASR Wau MK Wau ASR Bud K428 Bud	1948 1958 1958 1958 1958 1958 1958 1958 195	BL 314 WG T9 WG T9 BL 314 BL 314 BL 314 BL 314 BL 314 BL 554 CO Rus BL 554 CO Rus BL 5554 CO Rus BL 5554 FU HUG FU YUOG FU WHU FU JYU FU JY FU JYU FU JY FU JY FU JYU FU JY FU	44444444444444444444445555544444555554444	00000000000000000000000000000000000000	Tim 54200 Tim 54200H Tim 54200H Tim 54200H Tim 54200H Tim 54200H Tim 54200H Tim 54200 Tim 54200 Tim 55200H Tim 5520H Ti		HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH	8.8.8.8.8.8.1.1.5.5.3.8.8.3.0.375.55.5.5.5.7.7.6.8.7.8.7.9.11118.18.66.67.7.7.9.10.6.6.6.6.7.7.7.9.10.6.6.6.6.7.7.7.9.10.6.6.6.6.7.7.7.9.10.6.6.6.6.7.7.7.9.10.6.6.6.6.7.7.7.9.10.6.6.6.6.6.7.7.7.9.10.6.6.6.6.7.7.7.9.10.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.6.7.7.9.10.6.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.6.6.7.7.7.9.10.6.6.6.6.6.6.7.7.9.10.6.6.6.6.6.6.6.7.7.9.10.6.6.6.6.6.6.6.7.7.9.10.6.6.6.6.6.6.6.7.7.9.10.6.6.6.6.6.6.6.6.7.7.9.10.6.6.6.6.6.6.6.6.6.6.6.6.6.6.6.6.6.6.	229.19.29.19.29.19.29.19.29.19.29.19.29.19.29.19.20.25.29.25.29.25.29.25.25.25.25.25.25.25.25.25.25.25.25.25.	0.02 % 1	HITTITITE COOFFETTETTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT

			EN	OINE D	ET.	AIL	s					FU!		EL	EC-				FRONT AXLE		ВЕ	AK	ES		BODY	MOU	INT-	SPR	INGS
Piston Displacement Compression Ratio	ession R	Torque Ib. ft.	N.A.C.C. Rated H.P.	Max. Brake H.P. at R.P.M. Given	Valve Arrangement	Camshaft Drive	Piston Material	Number and Diameter		Oiling System Type	Governor Make	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make	Universals Make	Make and Model	Steering Gear Make	Make, Location Carrype, Operation	Lining Area	Drum Material	Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear
342844 46114 46115 52015 662415 78285 83534 94624 94644 94	07939183111151166254161252000122266633838888800833377444489667	$\begin{array}{c} 150 \\ 150 \\ 198 \\ 238 \\ 198 \\ 245 \\ 268 \\ 268 \\ 268 \\ 268 \\ 268 \\ 340 \\ 268 \\ 268 \\ 330 \\ 268 \\ 268 \\ 3300 \\ 3300 \\ 3300 \\ 3300 \\ 3400 \\ 3252 \\ 2200 \\ 2240 \\ 2220 \\ 2220 \\ 2220 \\ 2220 \\ 2220 \\ 2230 \\ 2300 $	$\begin{array}{c} 271 \\ 333 \\ 361 \\$	65-276f 65-276f 73-2400 82-2400 182-2400 187-2500 87-2500 87-2500 80-2800 107-260 107-	LLLLHHHHHHLLLLLLLLLLLLLLLLLLLLLLLLLLLL	608608080808080888888888888888888888888	CCCCCCCACCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	7-2 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	50 13 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PC PC PC PC PC PC PC PC PC CC CC CC CC C	Moo	Tilen	MI M	ALL AALL AALL AALL AALL AALL AALL AALL	ALLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL	P.MM P.Ro P.Ro P.Ro P.Ro P.Ow P.Ow P.Ow P.Ow P.P.Ow P.P.Ow P.P.D P.Ro P.P.BL P.BL P.BL P.BL P.BL P.BL P.BL P.	Pee	Bilo Bilo Bilo Bilo Bilo Bilo Bilo Bilo	Own 300 Own 300 Own 400 Own 500	HOSE ROSE RESERVED RE	Weila Laith Weila Laith Weila Weila Laith Weila Weil	4565546884677666567766666666666666666666	DDDDDDaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa	COUNTIFIED TO	Opt Opt 1100 1120 1120 1120 1120 1120 1120 112	612 704 648 566 568 566 699 699 833 833 833 833 533 533 533 533 533 533	31144444444444444444444444444444444444	40x214 40x324 40x33 40x3 40x3 40x3 40x3 40x3 40x3 40	50 13 13 13 13 13 13 13 1

Type

LILLILLILL TO THE CONTROL OF THE CON

1	u.	NER	RAL	(200	Keynote))	TIRE	SIZE			MAJO	R	UNI	TS					FRAM	-
				pet	ht	(pec			ENGI	NE	TRANSMI	SSI	ON	REA	RA	XLI	Е		80	
MAKE AND MODEL	Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Aux. Location and Speeds	Make and Model	Gear and Type	Drive and Torque	de Kal	R TOS	Side Rail Dimensio	-
Le Moon	10 DP 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	1750 2850 3300 33025 3300 5335 3300 5335 3500 4500 6500 6500 6500 6500 6500 6500 6	1600 1695 1153 1153 1184 1138 1153 1184 1138 1153 1184 1184 1184 1184 1184 1184 1184 118) 190 190	21600 12000 12000 15000 18000 18000 22000 22000 22000 22000 22000 23000 18550 15450 15500 18000	6000 6000 7200 6300 6300 6300 64856 6200 6600 64856 6200 6600 64856 6700 6800 78556 7856 7856 7856 7857 7857 7857 785	B8.25/20 B8.00/20 B8.00/20 B8.00/20 B8.00/20 B8.00/20 B8.00/20 B8.00/20 B8.00/20 B8.75/20 P7.00/20 P7.00/20 P7.50/20 B8.75/20 P8.75/20 B8.75/20	DP86x8 DB9.75/22 DB9.75/22 DB10.50/22 DB10.50/24 DB10.50/20 DB9.75/20 DB11.25/24 DB10.50/20 DB9.75/20	Own AC Her WXC3 Her RXC3 Her RXC3 Her RXC3 Her RXC4 Her WXC3 Her WXC3 Her WXC3 Her WXC3 Her WXC3 Her WXC4 Her WXC4 Her OX Her OX Her OX Her OX Her WXC5 Her WXC6 Her WXC7		BL 314 BL 514 FU VUOG FU VUOG FU VUOG BL 314 BL 314 BL 315 BL 51 BL 516 BL 516 BL 615 BL 70 Own BG Own BG Own AB Own BC Own AB Own BC Own AB Own BC Own BC Own AB Own BC Own AC O	00000000000000000000000000000000000000	00000000000000000000000000000000000000	Tim 56200H Tim 58200H Tim 58200H Tim 58200H Tim 56200H Tim 56730L Tim 66720W Tim 66720W Tim 66720W Tim 66720W Tim 56200H	CDF 2FF DDDDDDDDDDZFF CCCCCCCCCCCCCCCCCCCCCCC	HARRARAHHHARHHHARHHHARHHARHHHHHHHHHHHH	046766677557777777758888000000000000000000	32 2 7 44 32 33 36 4 34 4 4 4 5 8 5 8 8 4 4 9 8 6 5 4 4 8 8 8 6 6 4 4 4 4 4 3 3 3 5 5 5 3 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	7 + x3x + 8x2 4 x 4 8x2 4 x 4 8x2 4 x 4 8x2 4 x 4 8x3x + 8 4 x3x + 9 4 x3x + 9 5 x3x 4 11 x3 x 4 10 4 x3x 4 8 5 x2 4 x 4 8 5 x2 4 x 4	PRITTITITOCOCCOCCILILIIIITTILLILICOCCOCCOCCCCCCCCCC

		_	_	EN	GII	NE D	ET	TAI	LS						FUE	T. 7	FRIC	CAL				FRONT		BR	AK	ES		BODY	MOI	TA	SPR	INGS
acement	Ratio	K	ft.	Rated H.P.	1	H.P. at	rement	haft Drive	rial	BEAR	ING	m Type	1 4	BKe	Make		System Make	Starter Make	and Make	ake	lake	lebo	ear Make	SERV	ICE		Location	of Frame	Axle	Frame		
Piston Displace		pressio	Torque lb. f	N.A.C.C. Ra		Max. Brake R.P.M. Give	Value Assess	Camshaft D	Diston Materi	100	Length	Oiling Syste		Governor M	Carburetors	Fuel Feed	Ignition Sys	Generator, S	Clutch Type	Radiator Ma	Universals M	Make and M	Steering Ger	Make, Location Type, Operation	Lining Area	Drum Material	Hand Type,	Cab to Rear	Cab to Rear	Width of Fr	Front	Roar
1 3 1 4 3 4 5 4 5 6 5 2 5 3 4 5 5 5 5 6 5 2 9 3 2 5 3 6 5 5 5 5 5 6 5 2 9 3 2 5 3 6 5 5 5 5 5 6 5 2 9 3 2 5 3 6 5 6 5 5 5 5 6 5 2 9 3 2 5 3 6 5 6 5 6 5 6 5 6 6 6 6 6 6 6 6 6 6	2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	557755555177447765677809988998887499550077444991665288872777 774499990777766655555444444444444444444444444444	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	139 440 140 440 140 440 140 146 150 146 160	99887000106776677999000000000000000000000000	$\begin{array}{c} -2.50 \\$	00 00 00 00 00 00 00 00				133111100110111113333111111111111111111	THE PROPERTY OF THE PROPERTY O		Oasaauaaaaawwaalaalawwwwwwwwwwwwwwwwwwwww	Str. Str. Str. Str. Str. Str. Str. Str.	M	DOR	DODDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD	D.B.L. D.	LO L	Petroper Pet	Shu 5510 Shu 5532 Own LB Own LB Own H2B Own H2C Own H2B Own F2A Tim 14706 Tim 14706 Tim 14706 Tim 14706 Tim 15733 Tim 15733 Tim 15733 Tim 26050 Tim 26050 Tim 26050 Tim 26050 Tim 350001 Tim 350001 Tim 350001 Tim 1600W Shu 1679-2 Tim 1679	UMA OWITHAM OWITHAM	1041MV 10	728.811.1.722.3.55.4.6.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.7.2.2.3.5.5.4.6.2.2.2.3.3.3.3.4.5.6.6.2.2.2.3.3.3.3.4.5.6.6.7.7.7.7.2.2.3.5.5.4.5.4.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.3.3.3.3.4.5.6.2.2.2.2.3.3.3.3.4.5.6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2	CC aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa	TTDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD	1044 144 144 144 149 96 120 120 120 120 120 120 120 120 120 120	Opt	34443344433444333311333313333333333333	44x3 38x2 4 38x2 4 38x2 4 38x2 4 41x2 4 41x2 4 41x2 4 41x3 4 41x3 4 41x3 4 41x3 4 41x3 4 42x2 4	3-41.4 3-4 5-41.4 5-41.4 5-41.4 5-41.4 5-41.4 5-41.3 5-41.

		OI	ENEF	RAL	(Se	e Keynote)		TIRE	SIZE			MAJO	R	UNI	тѕ					FRAM	E
Wheel				e e	pet	# 1	1	-		ENGI	NE	TRANSMIS	SSI	ON	REA	R A	XLE			sue	
WAKE AND FOR THE PROPERTY OF T		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	:	Front	Rear	Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Forward Speeds	Aux. Location and Speeds	Make and Model	Gear and Type	ive and Tor	High	RS In Low	Side Rail Dimensio	Type
Sterling	0677778889911111222222688383857 1233234 557 121111111122222068885515224311053117BVB2B354X55599998888555	0748888X100 1-1-22-23-33-4 1	6190 6790 6790 6790 6790 6790 6790 6790 67	1922192219221922192220002200001300130013001300130013001300	22222222222222222222222222222222222222	826 84 84 84 84 84 84 84 84 84 84 84 84 84	$\begin{array}{c} 750 \\$	P36x8 B9.00/20 P40x8 P36x8 P40x8 P50x20 B6.50/20 B6.50/20 B6.50/20 B7.50/20 B7.50/20 B8.25/20 B9.00/20 B9.75/24 B9.00/20 B9.75/20	B6.50/20 B6.50/20 B6.50/20 B6.50/20 D6.50/20 D6.	Own T2 Own 6MK Own 68RL Own 68RL Own 68RL Own 68RL Own 68RB Own 6RB Wau 6ML Own 12K Wau 6ML Own 12K Wau 8RL Own 12K Own 12K Own 12K Own 2A Own GRCB Own 3AD Own GRCB Own 4A Own 6RCB Own 3AD Own 6RCB Own 3AD Own 6RCB Own 1AB	C C C C C C C C C C	Own UC2 Own UC2 Own UC2 Own UC2 Own UC2 Own UC3 Own FM Own SB Ow		OJ ODDDDDDDDOOOGGGGGGGGGGGGGAAAAAAAAAAAAAA	Own Tim Own Own Own Own Own Tim Own Own Own Tim Own Own Cla	WWW.25255555555555555555555555555555555	RRRRHHHHHHHHHHHRRRRRRRRRRRRRRRRRRRRRRRR	Dp Dp Dp Dp Dp Dp Dp 1, 73 1,	Op Op Op Op Op 22 2 2 19 5 19 5 23 4 26 2 23 4 41 4 41 4 41 4 49 7 77 8	19 12 x 3 x 4 x 4 x 4 x 4 x 4 x 4 x 4 x 4 x 4	BBHHOCOCOCOCOCOCOCOCOCOCO
Six-Wheele Autocar. GE 4: Chicago, 1-56-D 4 Corbitt. 208W6 4: 288W6 4: 408W6 4: 408W6 4: 408W6 4: 402 4: Diamond T.801 4: 1602 4: Douglas. F66 4: Fageol. 4-46 4: 6-26 2: 8-46 4: 10-26 2: 10-46 4: 10-26 2: 10-46 4: 10-26 2: 10-46 4: 10-26 2: 10-46 4: 10-26 2: 10-46 4: 10-26 2: 10-46 4:	R RRRRRR	10 10 3-5 5-71/4 71/2-10 10-15 8 10	1250 600 572 638 880 1100 529 639 414 560 640 750 630 600 650 630 690 740	0 O O O O O O O O O O O O O O O O O O O	08 23 08 22 09 00 00	p 22000 1 1 2 2 2 2 2 2 2 2 2 3 2 2 2 3 4 5 0 1 2 2 2 3 4 5 0 0 1 2 2 2 3 4 5 0 0 1 2 2 2 3 4 5 0 0 1 2 2 2 3 4 5 0 0 1 2 2 2 3 4 5 0 0 1 2 2 3 0 0 1 2 3 0 0 0 1 2 3 0 0 0 1 2 2 3 0 0 0 1 2 3 0 0 0 1 2 3 0 0 0 1 2 3 0 0 0 1 2 3 0 0 0 1 2 3 0 0 0 1 2 3 0 0 0 1 2 3 0 0 0 0 1 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22740 00000 1500 1500 1500 1500 2250 1170 1170 1170 1170 1185 1185 1185 1185	D P9.75/20 D B9.75/20 D B7.50/20 D B7.50/20 D B7.50/20 D B7.50/20 D B3889 D B8.25/20 D B9.00/20 D P36x8 D P36x8 D P36x8 D P36x8 D P36x8 D P36x8 D B6.00/20 D B7.00/20 D B7.00/20 D B9.00/20 D B9.00/20	DP9.75/20 DB9.75/20 DB7.50/20 DB7.50/20 DF34x7 DF36x8 DF36x9 DB8.00/20 DB9.00/20 DB9.00/20 DB9.00/20 DB7.00/20 DB7.00/20 DB7.00/20 DB9.00/20 DB9.00/20 DB9.00/20	Ste LT5112: Wau 68RL Con 20R Con 21R Con 16H Con 16H Con 21R Con 16H Her YXC Her RXB Her RXC Wau 6RB Own Own Own Own Bud GL6 Wau MK Wau SRK Wau 8RK Wau 8RK Wau 8RK	6 -5 \(\) x 6 5 6 -4 \(\) x 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6	BL 714 6 BL 60 8 BL 615 8 BL 607 8 BL 607 8 BL 707 8 BL 554 8 BL 1714 8 BL 1714 8 BL 1714 8 BL 1714 8 BL 170 6 Wn 6 Wn	UAUAAAAAAAAUUUUUUUUUU	4757777777777445844AAA	Tim 58200H Tim 56200H Tim 56200H Tim 58200H Tim 58200H Tim 58200H Tim 58200H Tim 58200H Tim 58200H Tim 80200 Tim 80200 Tim 8W1000 Tim 8W200 Tim 8W3100 Tim 8W3100 Tim 8W310 Tim 8W310 Tim 8W310 Tim 8W310 Tim 8W310 Tim SW310 Tim Own Tim Own Tim Own Tim Own Tim Own	WIWING WING WING WING WING WING WING WIN	RRHHRRRRRHRRRHHHRRRRRRRRRRRRRRRRRRRRRR	8.2 7.75 Opt Opt Opt 7.5 8.5 9.0 Opt Opt Opt 5.83 67.77 66 5.11 5.11 5.11 5.11	82. 673. Opt Opt Opt Opt Opt Opt Opt Opt	10 14 x 3x th 8 x 3 14 x th 8 x 3 14 x th 8 x 3 14 x th 8 x 3 x th 10 1 x 3 14 x th 10 1 x 3 14 x th 21 10 x 3 14 x th 6 10 x 3 14 x th 6 10 x 3 14 x th 9 x 3 14 x 14 9 x 3 14 x 14 17 th x 2 3 14 x th 17 th x 2 3 14 x th 17 th x 2 3 14 x th 17 th x 2 3 14 x th 8 x 3 14 x th 8 x 3 14 x th 8 x 3 14 x th	POTOTTOCOPPEPPOCOTOCOCO

				E	NOI	NE DI	ET	AI	LS				FU	EL ST.	ELTR		AL				FRONT AXLE		В	RAK	ES		BODY	MOI DA	INT-	SPR	INGS
Line Number	Piston Displacement	Compression Ratio	Torque Ib. ft.	N.A.C.C. Rated H.P.		Max. Brake H.P. at R.P.M. Given	Valve Arrangement	haft Drive		r and	Oiling System Type	Governor Make	Carburetors Make	Feed	rnitio		Generator, Starter Make	Clutch Type and Make	Radiator Make	Universals Make	Make and Model	Steering Gear Make	Make, Location of Type Operation	Lining Area	Drum Material	Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear
3456789011234567890112345678933133333344444444444444555555555555566666666	1979 1920 1930	54.5.5.5.5.5.5.48.5.88 00062266255.7666655555556996627788888888888888888888888888888888	300 300 300 300 300 300 300 300 300 300	$\begin{array}{c} 1440 \\ 440 \\ 441 $	98 1111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	\$5-\$50 \$5-\$50 \$10-\$20 \$20 \$20 \$20 \$20 \$20 \$20 \$20 \$20 \$20	00 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	COLOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOC	**************************************	は、「中央のでは、「中のでは、「中の	PCCCPPPCCPPFCCCCCCPPPCCPPFFCCCCCCCPPPCCPPFFCCCCCC	NO WIS WIS NO ON THE STATE OF T	ZZEGEGEGEGEGEGEGEGEGEGEGEGEGEGEGEGEGEGE	Man MM M M M M M M M M M M M M M M M M M	II DEFENDED TO THE TOTAL PROPERTY OF THE PROPE	EULUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU	ORREST OF THE STATE OF THE STAT	DOWN DOWN DOWN DOWN DOWN DOWN DOWN DOWN	Owo	Spi	Shu 5432 Shu 5432 Shu 5572 Shu 5572	W Roa Haah Haah Haah Haah Haah Haah Haah Ha	WS4IA B4IM C4FXN C4F	565690 66696255522255044544566666633333355557222222223332334344457123344445712334434445712334445712334444571233444445712334444457123344445712334444457123344444571233444445712334444571233444457123344444571233444445712334444457123444445712344444571234444457123444457123444444571234444445712344444445712344444445712344444445712344444445712344444457123444444444444444444444444444444444444	28 a a a a a a a a a a a a a a a a a a a	21 CCC 22 CTTFC FC 44 44 44 TTTTTC CCC 22 CTTFC TTTTTTTTTTTTTTTTTTT	104 104	173、830606011 .588279996005777000611 .588288877889960057777777777777777777777777777777777	434.44.44.44.44.44.44.44.44.44.44.44.44.	40x3 40x3 35x1 34 35x1 34 35x1 34 35x1 34 35x2 34 45x3 45x4 45x2 34 40x2 34 41x2 34 41	
	98 4 100 4 101 4 102 6 103 4 104 4 105 6 106 4 107 1 111 2 111 2 111 3 114 3 115 4 116 4 117 4 117 4 118 4 119 4	80 4 4 4 4 4 2 7 4 4 2 7 4 4 2 7 4 4 2 7 7 2 7 7 2 7 7 7	7.522225	175 175 1800	66.145.940.045.9440.045.9445.9445.9445.9445.	156-1: 102-2: 89-2: 100-2: 127-2: 100-2: 127-2: 111-2: 111-2: 111-2: 127-2: 114-2: 148-2: 160-3: 175-3: 188-2: 108-2: 108-2: 109-2: 109-2: 109-2: 114-2: 109-2: 109-2: 109-2: 114-2: 109-2: 109-2: 109-2: 114-2: 109-2:	800 400 400 600 600 600 600 600 600 600 6	10	990000000000000000000000000000000000000	A 7-3 C 7-3 C 7-2 C 7-2 C 7-2 C 7-2 A 7-3 N 7-2 A 7-3 C 7-3 A 3-2 C 7-3 A 3-2 C C 4-3 A 3-2 C C 4-3 A 7-3 A A 7-3 A A 7-3 A A 7-3 A A 7-3 A A 4-3 A A 4-3	63% FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	PPPPPPPPPCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	Wa No No No No CCo CCo Ha Ha WNO NO NO NO NO NO NO NO NO NO NO NO NO N	Zen Str Zen	M	NE ALL DRR DDR ALL DRR DDR ALL DRR DDR DDR DDR DDR DDR DDR DDR DDR D	00000	R P.BI. R P.BI. R P.BI. R dp.B R dp.B L D.Co. L D.Co. L D.Co. N P.BI. R P.BI. R P.BI. R P.BI.	L PP GG GG GG FF FG FF FG FF FF FF FF FF FF	O Spin Spin Spin Spin Spin Spin Spin Spin	Tim 35100 Tim 27450 Tim 27450 Tim 36020 Tim 36000 Tim 35000 Shu 615 St Tim 35000 Tim 35000 Tim 35000 Tim 35000	in i	Tél.A	IV IA IA II II II IV IV IA IA	720 536 459 525 536 720 571 238 238 238 175 365 960 459 630 630 630 630	a	18	1 1/2 10 10 10 10 10 10 10 1	11 14 3 3 3 3 3 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6	4 1/4 x 1/4	50x4 66x4 64x5 64x5 50x4 50x4 50x4 43 ½ x 65x3 43 ½ x 46x3 46x3 46x3 46x3

.

T		818	a	ENEI	RAL	(Se	Keynote)	TIRE	SIZE			MAJ	OR UNI	rs				FRAM	E
		Wheelers				per	Į,	(pag			ENG	INE	TRANSM	ISSION	REA	AR A	XLE		***	
Line Number	MAKE AND MODEL	Wheels Driven-6-V	Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds Aux. Location and Speeds	Make and Model	Gear and Type	Drive and Torqu	GEAR ATIOS	Side Rail Dime	Type
277 289 301 321 334 41 355 46 47 42 43 44 45 46 47 48 49 50 85 56 56 56 56 56 56 56 56 56 56 56 56 56	E28W D2D E2D A6608W A6008W A6000 X A60	2CRRARRAGARRAGARRAGARRAGARRAGARRAGARRAGA	734 10 9-12 5-6 6-7 6-7 7-8 8-10 10-12 10-12 8-15 8-15 8-15 8-15 8-15 8-15 8-15 8-15	6850 8800 9500 10200 10200 12000 12000 12000 12000 135350 6775 8500 9000 21000 (11) (11) (11) (11) (11) (11) (11)	1451 1401 1401 1401 1701 1701 1701 1881 1700 1855 1700 000 000 1855 1888 1888 1888 1888 1888	1887 1822 1887 1822 2066 2240 Op Op Op Op Op Op Op Op Op Op Op Op Op	28000 36000 36000 36000 36000 36000 36000 38000 28000 28000 28000 28000 28000 28000 28000 28000 34000 34000 34000 345450 45453 4550 45550 34500 34500 34500 34500 34500 34500 34500	3975 4235 4210 5620 6100 9600 9600 12000 9500 13000 9500 13000 9500 13000 12000 13250 6100 8500 8200 12000 13650 8500 8500 13650 14000 14550 15900 12800 12800 12800 12800 12800 12800 12800 14000 12850 14000 14550 14000 140	P40x10 B9.00/20 B7.50/20 B7.50/20 B7.50/20 B9.75/20 B10.50/24 B7.50/20 B9.75/2	P32x6 P32x6 P32x6 P32x6 P32x8 P32x8 DP32x8 DP32x8 DP34x7 DP34x7 DP40x10 DB9.00/20 DB7.50/20 DB7.	Con W10 Con 17E Con W10 Con 17E Con 18C Con E600 Con E600 Con E600 Con E600 En E600 Con E600 En E7 En	4 14 14 14 14 14 14 14 14 14 14 14 14 14	BL 714 Own U Own Own Own Fu VUOG Fu MHU Fu JVU BL 60-7 BL 714-703 BL 224 BL 224 BL 234 BL 334 BL 334 BL 714	U44No 104No	Cia B373A Cia B373A Cia B373A Cia B373A Cia B373A Cia B373A Cia B610A Cia B642 Tim 58200H Wis Own Own SW200 Tim SW200 Tim SW200 Tim SW200 Own 985 Own 2513X Eat 44000 Eat 44000 Eat 44000 Extra SW75 Tim SW70 Tim SW70 Tim SW70 Tim SW70 Tim SW70 Tim SW70 Tim SW71 Tim	SFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	HHHHHHHHHHHHHHRRRRRRRRAAAAARTTRRHHHHHHHH	38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 40. 38 16 46. 87 74. 50 153.	8 822 % x 14 6 823 % x 14 9 6 x 24 9 6 x 24 1 11x3 % x 14 1 11x3 % x 14 1 11x3 % x 14 1 11x3 % x 14 1 12x3 % x 14 8 2 14x 3 % x 14 8 2 14x 3 % x 14 1 2 1	CCCCCPPPCCTTTTTTTTTTTTTTTTTTTTTTTTTTTTT

KEY TO ABBREVIATIONS AND REFERENCE MARKS

GENERAL

Chassis Price—Chassis price quoted applies to the standard wheelbase and specifications listed. All prices are F.O.B. factory.

Oross Vehicle Weight—Is chassis weight, plus body and cab, plus payload. Gross vehicle weight given is governed by the three specified.

Chassis Weight Stripped—Includes gas, oil and water and all things included in chassis price. Does not include the weight of cab.

Maximum Brake H. P. at Given R.P.M.—Is actual dynamometer reading without accessories.

Tractors—Unless given the designation N (meaning not available as tractor), all standard models may be assumed to be available as tractors.

(N) Not available as tractor.

(T) This designation accompanying a model number indicates vehicle is specifically designed for tractor use only

(3) Corbitt—Larger engines and corresponding transmissions, clutches, axies etc., provided on all models of Corbit trucks when type of service requires them. Wheelbases of tractor models depend upon types of cabs and trallers chosen Cab to Rear of Frame and Cab to Rear Axie dimensions vary with such choice.

(4) Day Elder—Model 75—1½ ton—same specifications except price—\$945, and larger tire sise—B6.00/20 front and DB6.00/20 rear.

(5) Dodge—F-61 available as special tractor truck with 146-inch wheelbase with model designation of F-60, at \$2645. G-81 available as special tractor truck with 146-inch wheelbase with model designation of G-80, at \$5250. (a) General Motors—Gross vehicle weight indicated for each model in table is the Straight Rating (combined weight of chassis, body, equipment and payload) for which chassis is designed and guaranteed to satisfactorily operate under average conditions. The size of the tires used does not affect this Straight Rating, but to secure maximum tire mileage it is suggested that the total gross weight be limited to a "recommended gross weight" for each tire equipment (type number) based on tire capacity and assuming nominal body allowance will result in payload range for export only as coach chassis. Double reduction axies optional in Models T-45, T-51, T-83 and T-95 at extra cost. Trailing type axies available on Model T-95 at price deduction.

(7) Grass Premier—Eight cylinder engines available on following models: 45-6 with Lyc. Gt at \$270 list; 55-6 with Lyc. HF at \$3355; 65-6 with Lyc. AEC at \$4065; 35 T-6 with Lyc. GU at \$1665; 45 T-6 with Lyc. HF at \$3185.

(8) International Harvester—A-1, 34 ton, same as A-2 except less spring leaves and smaller tires.

(9) LeMoon—Model 600 available with Lyc. AEC at same cost. Models 701 and 801 available with Waukesha 6SRL at same cost.

(11) Pierce-Arrow—Prices not established by factory in time for publication. Prices assured for next issue.

†Reo—Models 1C and 1D are the longer wheelbase editions of Models 1A and 1B. The frame dimension of both is $7x2\frac{1}{3}x\frac{1}{11}$.

(12) White—The maximum ratings are for ideal operating conditions and the minimum for extremely difficult conditions; the ranges between are for varying operating conditions. Each model shown is furnished with different specifications for different ratings.

MAKES-ALL

AB—American Bosch. AL—Auto Lite.

B—Bendix,
BB—Borg & Beck,
BB—Borg & Beck,
BE—Bendix front,
Eaton rear,
BL—Brown-Lipe,
BO—Bendix front, Own rear,
Bf—Bethlehem,
Blo—Blood,
Bu or Bud—Buda,

C or Col—Columbia.
CB—Columbia front, Bendix rear.
CB—Carter.
Ch—Chicago.
Cl or Cla Clark.
Cle—Cleveland.
Co—Covert (transmission).
Co—Continental (governor).
Con—Continental.
Cot—Cotta Gear.

DG—Detroit Gear and Machine, DR—Delco Remy.

Eat—Eaton. Ei—Eisemann.

Fe—Fedders.

Ge-Gemmer.

Ha—Handy (governor).
Ha—Hannum (steering gear),
HaS—American Car & Fdry,
Her—Hercules.
H5—Merchant & Evans (clutch),
H5—American Car & Fdry, (governor),

Jac-Saginav

KP-Handy.

L—Lockheed.
LN—Leece Neville.
Lo—Long.
LO—Lockheed front, Own rear.
Lyc—Lycoming.

Mc—McCord,
Ma—Marvel,
ME—Merchant & Evans,
MM—Mechanics Mach.
Mo—Modine (radiator),
Mo—Monarch (governor),

NE-North East. No-Not supplied. ns-No Standard.

O or Ow-Own. Op or Opt-Optional.

Pe—Pierce (governor),
Pe—Perfex (radiator),
Pet—Peters.
PeS—Peters and Spicer,
PS—Peters & Snead.

RB—Robt. Bosch Ro—Rockford. Ros—Ross.

S—Steeldraulic,
Sal—Salisbury,
Sc—Scintilla,
Sch—Wheeler-Schebler,
She—Sheldon,
Shu—Shuler,
SpB—Spicer and Blood,
Spi—Spicer,
SpP—Spicer and Pick,
Ste—Detroit Lubro. (carburetor),
Ste or St—Sterling,
Str—Stromberg.

Ti—Tillotson.
T or Tim—Timken.
TO—Timken front, Own rear.

WQ—Warner Gear.
Wa or War—Warner Corp. (steering gear)
Wa—Waukesha. (governor).
Wau—Waukesha.
Wor Wis—Wisconsin.
Wo—Wohlrab.
Ws—Westinghouse.

Yo-Young.

Zen-Zenith.

	ENGINE DETAILS									FUI	EL ST.	TRI	EC-	L			FRONT AXLE		BRAKES					MOUNT DATA		SPR	INGS			
Piston Displacement				1 3	Max. Brake H.P. at R.P.M. Given	-		E	MAI	N NGS	Oiling System Type	Governor Make		1	ake	Make	a ke	Radiator Make	Universals Make	Make and Model	Steering Gear Make	SERVICE			80	e u				
		Compression Ratio	e			Valve Arrangement	121	Piston Material	Number and Diameter	Length			Carburetors Make	Fuel Feed	Ignition System M	Generator, Starter	Clutch Type and M					Make, Location, Operation	Lining Area	Drum Material.	Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear
5 549 6 677 7 396	77152007122278222838318387717844055444444444444444444444444444444444	454562546666733334479434422211225556698888006555554444444444444444444444444444	1501 181 181 181 181 212 460 3300 300 300 460 240 333 335 460 186 283 330 300 300 300 300 300 300 300 300 3	551.37 348.93 445.96 600.08 445.96 600.08 445.96 600.00 445.96 600.00 445.96 600.00	87-250 97-200 97-200	00 1 1 00 1 1 00 1 1 00 1 1 00 1 1 00 0 1 1 00 0 1 1 00 0 1 1 00 0 1 1 00 0 1 1 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	000000000000000000000000000000000000000		3-2-2-1-1-1-1-1-1-1-3-3-3-3-3-3-3-3-3-3-	5/4 青年 11 11 11 11 11 11 11 11 11 11 11 11 11	PC FP PC PC PC PC	Moo	Zen	MY WMM MMM MMM MMM MMM MMMM MMMM MMMMM MMMMM	DR DR DR DR	DRR DDRR DDRR DDRR DDRR DDRR DDRR ALL ALL ALL ALL ALL ALL ALL DDRR DDRR	dp. Lo D. Fu D. Fu D. BL D. BL D. BL D. BL P. Ow P. Ow P. Ow P. D. P. Lo P. Lo D. Fu D. Ow	LOOUNG CON	Spi Spi	Cla F212 Cla F214 Cla F304 Cvan T738 Wis M Own M Own Cvan F304 C	ROSE ROSE ROSE ROSE ROSE ROSE ROSE ROSE	L41HV We41A We41A We41A We41A L61HV L41HV L41HV L41HV L41HV We4rA We4r	312 414 495 495 502 3504 557 777 459 459 459 459 459 459 459 459 459 459	a a a a C C a a a a a a P C C C C C C C	TXX TYX TYX TYX TYX TYX TYX TYX TYX TYX	162 162 162 162 162 162 180 180 180 180 180 180 180 180 100 100	64 14 64 63 64 64 64 64 64 64 64 64 64 64 64 64 64	344 344 344 36 36 36 36 36 36 36 36 36 36 36 36 36	40x2 ½ 42x3 42x3 42x3 42x3 42x3 42x3 42x3 44x3 44	40 \(\) \(\

KEY TO ABBREVIATIONS AND REFERENCE MARKS

BRAKES—SERVICE Location

2—Two Wheels, rear only.
2/4—Two-wheel brakes effective on all four wheels through driveshaft.
4—Four Wheels, front and rear.
4r—Four Wheels, rear only.
6—Six Wheels, front and rear.
J—Jackshaft.
P—Propeller shaft.

Type I-Internal. X-External.

L

Operation

A—Air.
D—Hydraulic and mechanical,
H—Hydraulic.
M—Mechanical.
V—Vacuum.

BRAKES-HAND

Location

C—Center of double propeller shaft,
2—Rear wheels,
4—Four wheels,
1—Transmission,
1—Transmission,
1—Driveshaft,

Type

D—Tru-Stop diak. I—Internal. X—External.

BRAKE DRUMS Material

A—Cast alloy iron,
A—American Car Fdry,
D—Dayton,
E—Ermalite,
O—Gunite,
H—Hunt Spiller,

S—Cast steel.

(Where a combination of any of the above is used, the first reference mark applies to the front and the second to the rear druma.)

CLUTCH

Type

D—Muitiple disk, dp—Double plate, O—Plate in oil, P—Single plate.

ENGINE

Valve Arrangement

H—In head. L—"L" head. T—"T" head.

Camshaft Drive

C-Chain.

Piston Material

A—Aluminum alloy.

B—Semi-steel.

C—Cast iron.

N—Nickel iron.

S—Aluminum alloy with strut.

Main Bearings -Rear main bearing.

Oiling System

CC—Pressure to main, connecting rod and camshaft bearings. FP—Pressure to main, connecting rod, camshaft bearings and piston pins.

PC—Pressure to mains and connecting rod bearings, PC—Pump, gravity and splash. PS—Pressure with splash. SP—Circulating with splash.

FRAME

Type

FUEL SYSTEM Fuel Feed

E—Electric pump Q—Gravity. M—Mechanical pump P—Pressure. V—Vacuum.

REAR AXLE Final Drive and Type

B—Bevel.
D—Dead.
F—Full-floating.
H—Hypold.
I—Internal Gear.
2—Double Reduction.
R—Relay—Pendulum Drive.
S—Spiral bevel.
W—Worm.
W2—Worm or Double Reduction
Optional.
½—Semi-floating.
¾—Three-quarter floating.

Drive and Torque

A—Radius Rods and Torque Arm. H—Hotchkiss. (springs)

R—Radius Rods. T—Torque Arm. U—Torque Tube.

SPRINGS

Auxiliary Type

34—Semi-elliptic above or below main springs.
4—Quarter elliptic,
6—Coll spring.
N—No.
0—Optional.

TIRES

B—Balloon.

DB—Dual Balloons.

P—High Pressure Pneumatics.

DP—Dual High Pressure Pneu
S—Solids.

DS—Dual Solids.

—Pneumatics at extra cost.

TRANSMISSION Location

A—Amidships, J—Unit with jackshi U—Unit with engine No—Not furnished, Op—Optional.

Auxiliary Location

No—Not furnished.
Op—Optional at extra cost.
A—Amidships.
R—Rear of amidships main transmission.
U—Unit with engine.

WHEELS DRIVEN

2C—Center pair of rear wheels, 2R—Rear pair of rear wheels, 4F—Front and center pair of rear wheels, 4R—Four rear wheels, 6—Six wheels.

The Commercial Car Journal

Confidence Game Tricks Shipper, Hauler & Trade

CONTINUED FROM PAGE 27

can depend. These operators also help in inducing the inexperienced victim to accept the plan outlined above. The broker is willing to have the trucks repossessed from the inexperienced operator as he then can repeat the racket with another individual.

It would, of course, be unfair even to suggest that shippers are willing participators in this racket. But Mr. McCarron is correct when he lists the reasons which prove that shippers are unwittingly supporting the racketeers. The reasons he gives are:

Unwitting Support

1. The average shipper does not have the time nor the inclination to investigate who is behind the firm that hauls his freight.

2. The average shipper does not investigate thoroughly the responsibility

of the contractor.

3. The average shipper seeks to have his freight hauled at the lowest price without regard for equitable

costs of operating.

But there is, as he further points out, a danger in this careless and selfish attitude. His ignorance of details may cost him a lot of money. He cannot afford to overlook the consequences of legal liability in the event of litigation; camouflaged insurance protection of the irresponsible operator does not protect the shipper. To prove this there is the case of Dunn vs. Reeves Coal Yard Co. (Minnesota), in which the court ruled: "An automobile truck owner temporarily employed by a retail coal dealer to make deliveries with the truck at an agreed rate per ton, with authority to collect C.O.D. charges and account therefor to the dealer, is, while so employed, the servant of the dealer, and not an independent contractor, and the dealer is chargeable with negligence in the operation of the truck on the street." The U. S. Supreme Court (Singer Mfg. Co. vs. Rahn, 132 U.S. 518) summed up this legal principle in these words: "A master is liable to third persons injured by negligent acts done by his servant in the course of his employment, although the master did not authorize or know of the servant's act or neglect, or even if he disapproved or forbade it."

There is, therefore, reason for shippers to interest themselves in the curbing of this racket. And they can do so simply by making sure that their freight shipments are dispatched through reputable, responsible carriers who protect the shipper's in-

And so far as the truck trade is concerned, reputable operators have every reason to expect the trade's wholehearted cooperation to stamp out this evil. The racketeering broker identifies himself the moment he mentions that the deal depends upon his getting a commission. To do business with him on that basis, as Mr. McCarron very aptly intimated in a letter to the writer, is not only suicidal so far as the dealer, distributor or branch is concerned, but homicidal so far as effects on the trucking business are concerned. It is suicidal because the dealer who plays along with the racketeering broker will find himself with repossessed trucks on his hands and a soiled business reputation that will cause legitimate truck customers to shun him; and homicidal because in digging his own grave the dealer has brought about a condition whereby honest truck operators and honest forwarding companies must resort to cutting each other's throats in order to underbid the dishonest freight brokers.

(Editor's Note:—Correspondence on this subject is welcomed. Members of the trade and operators are urged to report details of racketeering instances which come within their per-

sonal experience.)

"Inflated List Prices Should Be Exploded"

CONTINUED FROM PAGE 47

mediately went into the production of six-cylinder trucks.

Later a truck was requested with specifications calling for standard parts of leading manufacturers to give a powerful and well-balanced truck for heavy-duty service. The request was refused yet the company in question three years later was forced into its construction by the demands of large oil companies. The very parts refused were incorporated in the job.

Every step was forced on the manufacturer. At no time was price the operator's consideration. A certain type of equipment was needed and price was a second consideration.

More recently a well-known group of companies was asked to build special light trucks of aluminum frames, cabs and bodies. Response was again refusal. Such jobs were built at a saving of 4000 lb. What has first cost to do with such a saving? Engineers look only to theory, present patterns and assembly facilities in production. They are afraid to be progressive on account of cost. Apparently they must be forced. They can only be forced by the operators.

Unwelcome Intervention

Regarding my fourth criticism-intervention of truck manufacturers in regulatory matters concerning operators only, is, in my opinion, sheer folly. I have reference to the appearance of manufacturers before legislative bodies through the National Automobile Chamber of Commerce and statements by them as to what is and what is not needed by operators. The American Car & Foundry Co. and other makers of rail equipment would not think of actively engaging in such controversies. In fact their activities would be resented by the law-making bodies. Truck makers might well pattern their policy in matters of this character after that of the rail equip-ment makers. If the truck makers wish to participate and help operators in legislative matters let them do it through the operators as the rail manufacturers do. Manufacturers need operators, just as we need them, but until coordinated action is taken jointly in all measures the results will be discord instead of victory.

GRAMM TRAILE

at Delphos

Gramm Engineers have just completed a new 3 to 5 ton trailer at the above low base price. Bodies and accessories will be equally low in price. Features will include standard length 14 ft. Available also in 16 and 18 ft. lengths. Husky 83/4" x 3½" x ½" drop frame. Timken 4" diameter tubular axle. Helper springs standard. Liberal dealer proposition for any truck or car dealer.

> Write or wire for complete information and prices

GRAMM MOTORS, INC. TRAILER DIVISION

DELPHOS

OHIO

Prices

ched be